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Oil, Paint and Drug Reporter

VOLUME 93. NUMBER 9. WEDNESDAY, FEBRUARY 27, 1918. 100 WILLIAM ST., NEW YORK

THE 1918 ANNUAL REVIEW—EXTRA EDITION

NYQ

Purity

PERHAPS the continuous emphasis we place on the purity of N. Y. Q. Products may seem to be unnecessary.

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Quinine and its Salts
Strychnine and its Salts
Thymol Iodide

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We believe that the purveying of trade information should be carried to the extent of meeting individual demands of readers and advertisers when such informative efforts are compatible with fair treatment of the general clientele of the Reporter.

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We believe that the Reporter can be made even more helpful, that the service extended its readers and advertisers can be made broader and more comprehensive; that, despite the care with which its market reports are compiled by expert hands, there are opportunities for still greater service.

We believe in our subscribers and our advertisers, in our corps of co-workers, and, what is still more important from the standpoint of any trade publication, we believe in ourselves and in the worth of our service to you and to the allied industries we have the honor to represent.

We believe you can help us by suggestion, by a statement of what you believe to be existing needs, by remembering that the Reporter is your representative and that it stands ready at all times to serve you.

Will you not, therefore, tell us how, in your opinion, the Reporter can be made more valuable to you, that we all may be the gainers thereby?

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UR 1918 ANNUAL REVIEW NUMBER OF MORE THAN ORDINARY IMPORTANCE BECAUSE OF READJUSTMENT OF WORLD MARKETING CONDITIONS.

T was with full realization of the unusual importance of the work of preparing the Annual Review number of the Oil, int and Drug Reporter for 1917 that the torial compilation of the present edition was dertaken. In no period in the history of foreign and domestic trade of the United tes have market conditions been so unal, so influenced by transportation and proction conditions, and so directly under the y of regulation, proclamation and enactnt of foreign powers as well as of the Fedl administration of the United States.

Every Reporter market in all its divisions l sub-divisions has been subjected to govmental scrutiny during the months that ve elapsed since the United States entered world conflict as a participant. In ny cases, in the production of chemicals ering into munitions manufacture, in the put and distribution of alcohol, oils, sulur, pyrites, potash and fertilizers, petrom and its products, paints and paint maals, this Federal scrutiny has been followed partial if not complete distributive control. For months imports and exports of certain nmodities—the regulations shifting from k to week by additions and by special rul—were under a special licensing system, ich was so new and so radical a departure m customary trade practices that even the deral authorities did not agree upon the rpretation. Later, and by proclamation of sident Wilson, this uncertainty was reved by the placing of all imports and exts under the license system.

Transportation facilities, both ocean and road, in addition to the interruption to mal traffic through enemy-ship raiding and establishment of sea frontiers, have been so rburdened by extraordinary demand upon m for the shipment of essentials to the wag- of war that it became necessary to estab- preference lists under which non-war maals stood little chance of movement been producer and consumer, no matter ere located.

Cessation of all traffic between enemy aliens this country and the Allies excluded from duction areas which have in the past been depended upon to produce minerals, botanicals, petroleum, vegetable oils, and dyes to enumerate some of the more important items, with the result that until steps had been taken to secure other sources of supply, or develop new productive industries in this country, the consuming factors in the United States suffered considerable hardship, prices were raised to record high levels, and stocks were seriously if not totally depleted in some of the varieties of commodities.

The closing months of the year 1917 developed a new and unusual condition because of the scarcity of fuel with the resultant closing of factories, elimination of so-called "nonessential" manufacture, and massing of goods at factory and at warehouse terminals.

All these influences were reflected in the markets, and the resulting price changes, the development of substitutes for previously used materials, as well as the creation of new industries, the shutting off except under government supervision of manufacture of such items as beverage alcohol, have called for a complete readjustment of market and manufacturing practices.

It is to the record of this extraordinary business year that the following pages are devoted. The work of preparation in a measure was handicapped by the same external influences which prevented the receipt of commodities from foreign sources. As a war measure many customary sources of information have been closed—data as to shipments both to and from abroad have been carefully guarded as a preventive measure for the protection of shipping from enemy aggression—foreign records of receipts have been compiled only for government purposes, and in France, in Italy and in Great Britain the control of the production and movement of hundreds of items has been complete and secret.

In this country, also, the same method of procedure has obtained, although not to such a sweeping degree, and although the important figures and data were finally obtained in the majority of instances it was necessary to await the completion of the year's records at the source before the official totals could be obtained. A single instance will illustrate this point: Under present rulings no export totals by weeks are given out at the principal ports of the country, and when made public the essential details of destination and consignee are omitted. It is, however, possible to obtain the fiscal and the calendar year import and export totals, and these will be found in subsequent pages in greater detail than it has been our custom in the past to present.

With the demands of the government for war necessities, the elimination of the nonessential, the conservation of coal, fuel oil, containers and supplies, with railroads and steamers crowded to capacity and with labor and other fixed charges much higher than in any previous year, it became necessary for all the large producers and the distributors in Reporter lines to adopt new methods of procedure. This was done without unnecessary friction, and with true patriotic realization of national needs. Just how it was done and just what will be effected during the present year it is the province of these industrial leaders and officers of national organizations to state, and they have done so in a series of illuminative articles which will be found in the following pages.

There is no place in the Annual Review for 1917 for what is ordinarily known as the "special article." This designation like charity "covers a multitude of sins" of omission and commission, for the special article in a trade review is too often lacking in what should be its prime essential—constructive force. This criticism does not hold good of the contributions of such industrial leaders as A. C. Bedford, chairman of the Petroleum War Service Committee; Gustav Egloff, the gasoline specialist; W. S. Topping, assistant chief of the Bureau of Explosives; Horace Bowker, of the first Fertilizer Committee of the Council of National Defense, and prime mover in the Chemical Alliance, Inc.; Dr. Henry C. Lovis, of the original advisory committee of the Council of National Defense, having to do with the fulfilment of government demands for surgical dressings, etc. These men have something to say well worth the reading.

In addition, the presidents of the great national associations of makers and handlers of paint, oil, drugs, pharmaceutical supplies, varnishes, glass, etc., have summarized the steps taken by their associations to meet the demands of the government, and have outlined what will be done during the year 1918.

New botanical drugs, the development of the logwood industry, and the new departure of the government in guaranteeing a supply of castor oil for lubrication purposes for our fleet of aeroplanes and Liberty motor trucks are subjects of special studies, all of which are illustrated by specially taken photographs. Much information not heretofore available appears for the first time in these special studies.

Lack of space forbids a more extended review of the contents of this extra edition of the Reporter, which is sent without charge to every subscriber as an essential feature of our yearly service. We would, therefore, call particular attention to the detailed index to contents which will be found on pages two and three.

We believe this Annual Review Number to be the most important in the long series of such annual editions issued by us, in that, although especial care has been exercised to make it complete, detailed, exact and comprehensive, the record of a year of such re-adjustment and change in method cannot but prove of vital import for reference purposes. Just as industry has expanded and enlarged its scope, so has the Reporter from week to week broadened its market reports and included hundreds of items never before listed, and the present Annual Review is the culmination of the year's work in completeness and in appeal to the interests of the great industries which it has the honor to represent.

HOW REPRESENTATIVE MEN IN REPORTER INDUSTRIES SUMMARIZE THE YEAR 1917

M. C. PETER,

President Peter-Neat-Richardson Company, Inc., Louisville, Ky.

The year that has just closed was fraught with unusual conditions, and yet the results have been fairly satisfactory. War has dominated and developed a splendid spirit of patriotic purposes to serve our country. Never before, since our government was formed, have the people been so firmly knit together. In this spirit we anticipate a bright future, expecting to encounter trials and vicissitudes, yet believing in the righteousness of our cause, we look for the vindication of the rigt to "life and liberty in the pursuit of happiness."

FRANK G. RYAN,

President Parke, Davis & Co., Detroit, Mich.

Nineteen seventeen, like the two previous years, has kept pharmaceutical manufacturers working to capacity. The supplies for the army and navy have been given preference, and, with a very active demand from the general trade, it has been difficult to supply all the wants for chemical and pharmaceutical products. The conditions have been abnormal, prices greatly advanced, and due to additional tax on alcohol prices have reached the highest level in the memory of most of us. Even under these conditions, there is no perceptible decrease in the demand. The outlook for 1918 is a continuation of activity only limited by available supplies of crude material and facilities for transportation. Coal shortage and supply of satisfactory labor will also have to be contended with. The limit of the consuming power of the country does not seem to have been reached as yet.

LUTHER MARTIN,

Vice-President Wilckes Martin Wilckes Company, New York.

We are pleased to advise that the past year, while it has been a satisfactory one so far as volume of business is concerned, still it has been the most troublesome we have ever had, so far as the raw material question goes.

There is no difficulty to secure business for 1918, but the manufacturers are going to find it difficult to secure raw material in order to keep their customers going. This, together with the embargoes, delays and congestion of the railroads, will work a hardship on the manufacturers.

We do not know whether the above reflects the opinion in other lines, but it is the case in our enterprise.

CLAYTON F. SHOEMAKER,

Shoemaker & Busch, Philadelphia.

I desire to say that the past year has been, so far as we are concerned, a very active one. Our sales have been larger than ever before in amount, which, of course, might be expected, and likewise we have been exceedingly busy. Business is hard to conduct, however, on account of the manifest conditions which hamper.

In regard to what the present year has in store for us, I cannot even predict. We can only live one day at a time. It seems to me, however, that the proper course to pursue is to look forward with cheerful optimism make the best we can of the situation, and keep our nerves in good condition. There is no use in being panic stricken, no matter what the conditions may be.

W. A. HARMON,

The Roessler & Hasslacher Chemical Company, New York.

With reference to your annual review of the past year's business, and the prospects for the future, would say that, like last year at this time, the prospects for the coming year are of a very doubtful and unpromising nature. The troubles we are having at present are in themselves sufficient to develop the conservative element where the same does not yet exist. It is possible that, like last year, the outlook will improve as our troubles are surmounted, and that, like last year, we can look back upon the year that has passed as satisfactory in the net monetary result, even though at the sacrifice of business progress and comfort.

C. L. FORGEY,

Berry Brothers, Detroit.

We closed the year of 1917 with a nice margin over 1916, and in order to keep up this pace in 1918, we know that it will be necessary to adapt ourselves to the new conditions. The territory must be covered more closely. We must pay more attention to the sale of specialties. The manufacturing business is above normal now in some lines, so we are going to put forth an extra effort to bring 1918 up to the maximum point, and this we believe we can do. Traveling expenses, labor, materials have all advanced in price, and this has narrowed the margin of profit to the point where the curtailing of expenses and intensified selling is made necessary. We believe we have the hearty co-operation of our entire force in this, and we expect it to work out successfully.

D. D. PEABODY,

Sales Agent Rosin and Turpentine, New Orleans, La.

Another naval stores producing year is at an end, and an idea can be had as to probable production of rosin and turpentine for the coming season.

Long before the approaching end of this season a large curtailment in operations was made, and it is now too late, on account of weather conditions, to open up new work, were any contemplated.

Probably about 15 per cent. of the negroes eligible for military service under the draft have been called, leaving 85 per cent. to be taken. This will cut largely into the colored labor absolutely necessary to turpentine operations. It would, therefore, not be the part of wisdom to attempt any large new production. On the contrary, many places will be entirely abandoned on this account, and for the reason they could not be maintained on basis of prices received for manufactured naval stores the season now closing. As near as it can be learned at this time, the production for the season 1918-19 will be 25 per cent. less than that of 1917-18.

I take occasion at this time to say I have made additional connections with some of the largest producers in this territory to market their naval stores for them, and I shall at all times be in position to quote on rosin and turpentine—any grade or quantity for delivery at any point, and respectfully solicit your inquiries and orders.

SAUNDERS NORVELL,

Chairman of the Board, McKesson & Robbins, Inc., New York.

TRANSPORTATION.—We are suffering seriously from delays on the part of railroads, both in incoming and outgoing freight. Cars and shipments are lost. Tracing these shipments is very difficult. The whole railroad situation seems to be badly demoralized.

COAL.—We have been doing business from day to day in fear and trembling, being afraid that we would have to shut down from a lack of coal. With us a shortage of coal in freezing weather would mean a tremendous loss, as a large part of our liquid drugs and chemicals would freeze and burst their containers. We have even gone to the extreme of securing salamanders and putting them in our liquid drug departments, prepared to burn boxes and lumber in them in case of a coal shortage. The situation looks better now.

WAR ORDERS.—The government continues to place war orders in our line, and these orders are very acceptable, as they are for large quantities and make good factory runs.

GOVERNMENT PAYMENTS.—Government payments have been prompt and satisfactory. We have had little difficulty on account of delayed payments. Considering the enormous volume of its purchases, we are surprised that the government has been able to handle the situation so well.

COLLECTIONS.—Collections in some parts of the country are slower, but taking the situation as a whole, we have no serious grounds for complaint.

CHARACTER OF BUSINESS.—We read about the elimination of unnecessary things and luxuries in business, but while the very rich no doubt feel economical and are curtailing their buying, people in moderate circumstances are earning more than ever and are buying liberally. Even with the high price of gasoline, there seems to be just as many automobiles as ever. A study of the reports of the saving banks in all parts of the country indicates the general prosperity of the people. While they are not spending less, it is quite evident from these reports they are also laying by for a "rainy day."

A study of the reports of the Clearing House shows an increase in the clearings in the leading cities in all parts of the country; also indicates, with special emphasis, the general prosprity.

SUMMARY.—Notwithstanding the war, taxes, and the many difficulties of doing business in these days, we enter 1918 with a feeling of optimism. This country is so much better off than so many other countries that all of us should work each day with a feeling of thankfulness.

J. C. NASH,

Vice-President Columbia Naval Stores Company, Savannah, Ga.

The naval stores industry, unlike the majority of industries in this country, has been seriously hurt by the war. Demand in this country is good, but export to our largest foreign customers is completely stopped, due to war conditions, and exports to countries which are still open to communication have become greatly restricted because of the scarcity of tonnage. Under these conditions prices have suffered, and are very low, as compared to almost every other raw material.

Because of substitutes for turpentine, there is an ample supply of this article in this country. In fact, somewhat of an oversupply, and it occupies the position of selling for fully as much as it is worth, according to the law of supply and demand, and bringing far less than its value in relation to cost of production.

As for rosin, the visible supply has decreased as the year has proceeded, which is in great contrast to turpentine. The export outlet is somewhat greater, as many vessels which take rosin will not take turpentine; furthermore, there is no cheap substitute for rosin, and it also goes largely into munitions of war. Under these conditions, the rosin situation is sound and the market is firm, though the price, like turpentine, is very low, as compared to other raw materials. During the past year the producing section has been visited by severe storms and unusually severe destruction of the pine forests in certain sections. This, together with the low prices of the article, is expected to cause an appreciable curtailment of next year's crop, and we think that those interested may expect a smaller crop, and advancing prices, as the truth of the above facts is felt, with the development of events.

C. W. DILL,

Vice-President Columbia Naval Stores Company, New York.

My views are in accord with those of Mr. Nash, my associate vice-president, except that, perhaps, he has not made the rosin situation as strong as he might have done this, so far as the outlook for next season is concerned.

Besides the curtailment on account of the destruction of timber, it is my opinion that the greatest factor that will produce the largest curtailment will be the lack of labor in the woods. I have before me letters from one of our men, who has just been through the producing section, and he states that the labor situation is much more acute than have heretofore thought, and it was his opinion t this would have the effect of curtailing the crop v materially next season.

This feature would effect turpentine as well rosin, but, of course, rosin would respond m quickly on account of the small surplus, as compa with the rather liberal supply of turpentine.

E. M. SERGEANT,

Second Vice-President Niagara Alkali Compa Niagara Falls, N. Y.

The demand for all of our products during the p year has been good and prices satisfactory. rather anticipate a continuance of this condition at least the first half of the present year, though course, the uncertainty of the present situation such that it is difficult to judge what future dev opments will be.

W. A. HOVER,

W. A. Hover & Co., Wholesale Druggists, Den Colo.

The drug business in inter-mountain territory v well sustained during the year 1917. In volume bu ness has been greater than that of preceding ye In a large measure, however, this increase has b due to increased values rather than actual distri tion. Jobbers' profits, if any, for the past year two years are represented by merchandise repla ments at greatly increased value. Due provis should be made to absorb present high values wi out too great a strain when the period of readju ment comes. Owing to conditions of transportati Western stocks are uniformly larger than previ years, and great care should be exercised, otherw losses incident to market declines may be sever felt.

We are in the center of large agricultural a stock-growing interests. General conditions good, owing to the high market value of everyth we produce. As for the future, we see no occas for alarm at this time. Trade prospects for the suing year are fully up to the average, and the ca ful merchant will make a good showing if he c tinues conservatism in buying and maintains c sistent profits on that which he has to sell.

J. K. LILLY,

President Eli Lilly & Co., Indianapolis, Ind

It is quite sure that certain factors have ente into the conduct of the drug business during that have been experienced by every establishm devoted to that line.

Out here in the corn belt high prices, higher pri slow deliveries, no deliveries, heavy demand and ratic demand have confronted manufacturers, common with those of other sections. Notwithsta ing all this, a large volume of business and sa factory profits resulted, and we enter 1918 with c siderable confidence in slightly more stable co tions. While prices will be unsettled, there see no likelihood of the general heavy advances that experienced in 1917. Freight conditions seem i fair way to be improved by the talent concentra on this problem by the government.

As long as the war lasts, a heavy volume of tr is insured, although profits may probably be l than on the sharply advancing market.

One "sure thing" is payment of taxes. This d not trouble us in Indiana, for every one in the St has joined the cult of cheerful tax payers. W not do smilingly that which you cannot escape?

Business "unusual" will no doubt be our lot u the war ends. It will also be very unusual dur the period of readjustmtnt, be that period long short.

A. F. KITCHEL,

Binney & Smith Co., New York.

Just at this time the market is extremely diffi to forecast, owing to the chaotic conditions in si ping circles. The serious delays which have occur in forwarding goods, have of course greatly redu or in some cases eliminated, stocks, with the re that there is at some points an abnormal dem which is difficult to meet. As to how this ma will work out depends entirely upon the results the new era in transportation.

Carrying out our promise of last year, we h very largely increased our manufacturing facili with the idea of maintaining our former policy producing sufficient amounts of the various gra of blacks to take care of the demands of our tr in such a way as to maintain prices as nearly n mal as possible. We shall continue along these li and endeavor to hold our former record with trade.

It may be well to state, in this connection, that matter of raw supplies is, of course, a very v one, and the rising value of gas and its products had a marked effect in the cost of blacks. By rangements for production in various fields, h ever, we have sought to equalize this increase value so as to minimize as much as possible the fect in general.

W. E. WALL,

President The Fred G. Clark Company, Clevela Ohio.

In respect to the conditions of the petroleum interests for last year, and the outlook for the suing year, I beg to state that the last year was best year I think that the American refiners h ever experienced.

Of course, this has been very largely due to fact that the refiners in Russia, Galicia and R mania were put out of business by the war, and American refiners had to supply this trade.

The outlook for next year, so far as the dem for petroleum products is concerned, ought to even greater than last year, but if the railroad c ditions don't very quickly improve, they will

ny of the refiners out of business entirely. At the sent writing, almost every railroad has put an bargo on oil. If this continues over a matter of or three weeks, the refiners will be obliged to it down at a tremendous loss, which cannot be ercome for a long time, and inasmuch as the deand for oil in the next couple of years will keep ery refinery going night and day, unless the govment gets quick action and arranges railroad fatities to make prompt shipment, the world will be t as much short of oil as the American refiners uld manufacture during the time the refineries shut down, and so long as it takes them to repair ir works after they are shut down.

So, in a word, the outlook for the refining business ks very bright, provided the refiners have no off by way of the railroad companies not moving ir products promptly.

EDWARD J. CORNISH,

President National Lead Company, New York.

The sales of white lead, both dry and in oil, have clined greatly. The sales of red lead and litharge ve increased. The explanation without doubt is at the high price of lead products, linseed oil, lors and wages have resulted in decreased conmption of white lead. The large increase in iron d steel products has resulted in an increased use red lead as a preservative thereof. The large inease in the manufacture of electric storage batries accounts in great part for the increased sales litharge. I personally see no reason to expect y change in the conditions in the near future.

J. E. HATT,

General Sales Manager Paints and Varnishes, E. I Du Pont De Nemours & Co., Harrisons Works, Philadelphia.

Our business the year passed has been satisfactory. nusual conditions have developed unusual probms. Peculiar circumstances have retarded progss in some directions; but in spite of everything that has been adverse, we have made progress and prospered.

During -1918 there will be ample opportunity to make use of all the brains and ability that can be commandeered in every American industry. It is only by a combination of resources and ability that the many obstacles and difficulties, due to war conditions, can be overcome.

The function of paint now is not simply to decorate, but to save and preserve.

Buildings and structures of all types having surfaces exposed to decay and disintegration must be protected to save replacement, which is expensive.

Paint furnishes the necessary protection, and its use is genuine economy.

The coming year paint business will largely be developed along the lines of educating the public that it is far more economical to paint and save than it is to omit and replace.

Unless unforeseen circumstances arise, we look for a prosperous year.

N. OWITZ,

Sales Manager J. P. Devine Company, Buffalo, N. Y.

The past year, 1917, has been the biggest and best year the J. P. Devine Company has ever enjoyed. The demands made upon us were tremendous, and, fortunately, our facilities were such that we were able to take care of the chemical and allied industry. Due to the tremendous demands we were compelled to enlarge our plant considerably, and have just finished a 50 by 250 foot addition, which will be devoted entirely to copper work. Ground has been broken for another similar size addition to take care of erecting, shipping and testing, and we are preparing plans for a 200 by 400 foot addition to our foundry.

This gives some idea as to the tremendous volume of work that passed through our hands last year, and our confidence in what the coming year will bring us.

We want to take this opportunity of saying that it is very gratifying to know of the great progress being made in the chemical, color, dyestuff and allied line. The amount of money invested in this field is very great, and tht naturally points to the fact that the manufacturers of equipment for this industry are kept quite busy supplying their demands.

S. W. FAIRCHILD,

Fairchild Bros. & Foster, New York.

The volume of our business for 1917 has been very satisfactory. Abroad we have not fared so well, not because of lack of demand, but owing to the difficulties and delays in shipping goods from here. Our factory in France has been in operation for at least half of the year, and the sales have been good. Collections, both at home and abroad, have been prompt. Our travelers' reports have been encouraging and, all in all, we have good reason to be pleased with results from our business in the past year.

As to the outlook for the coming year, the problem of transportation is the one that gives us most concern at the present moment. The uncertainties of shipping by express or freight, by rail or water, confront us at every turn. But, being naturally of an optimistic turn of mind, we shall keep right on doing the best we can and hoping for more satisfactory conditions in the near future. And, of course, we share the common hope that a peace honorable to our country, just to all, and permanent, may be arrived at during the present year.

J. WRENCH,

Sales Manager Industrial Chemical Company, New York.

Business conditions during the past year have been very good with us, the demand for practically all our products being in excess of the supply. In some respects consumers during the last quarter showed a conservative tendency, undoubtedly due to the government action and the effect of the closer relation of this country to the war. Generally, we feel this attitude will necessarily continue, but should the transit conditions improve, we view the prospects for the new year as bright.

SPECIAL ACCOMPLISHMENTS OF REPORTER INDUSTRIES DURING YEAR 1917 AND WHAT WILL PROBABLY BE ACCOMPLISHED DURING PRESENT YEAR

What Have Been the Special Accomplishments in the Fertilizer Industry in 1917, and, in View of War Conditions, What Will 1918 Bring Forth?

HORACE BOWKER,
President, Chemical Alliance, Inc.

THE year just closed proved a veritable kaleidoscope of shifting conditions and extraordinary problems for the fertilizer industry. Following the entrance of this country into the war, matters soon became so acute that it was decided to maintain a committee at Washington to represent the industry in the matter of securing raw materials, freight preference, ocean tonnage and in various other situations which constantly arose. This committee soon became a sub-committee of the Advisory Commission of the Council of National Defense and so remained until December, when it became the Committee on Fertilizers of the Chemical Alliance, Inc.

Transportation and Supply Problem.

Following the spring business, the first big new problem presented itself when submarines materially cut off the pyrites supply from Huelva, Spain. Throughout the latter six months of the year, only occasional cargoes docked at American ports. The first solution suggested was to substitute brimstone from Louisiana and Texas. This necessitated changes in burners, but many acid plants made the necessary changes and derived their sulphur from this new source. Government requisitions and lack of boats interfered with the free movement of brimstone to northern factories and at times the reserves on hand at the larger plants were extremely low.

Domestic Pyrites Developed.

One of the interesting developments arising from this situation was the development and opening up of numerous domestic pyrites mines. Deposits had long been known to exist in many states, notably Missouri, Tennessee, Virginia, and the Carolinas, but until this time had not been extensively worked. These workings have now attained considerable proportions and a number of large fertilizer acid plants now depend to a considerable extent upon this source of supply.

Phosphate Rock Shortage.

As the season advanced, many northern manufacturers began to experience a shortage of phosphate rock. Plenty of rock was available at the mines, but satisfactory rail and water transportation could not be effected. The government commandeered several boats and finally the railroads became so overtaxed that they declared an embargo on all rock billed to plants north of Norfolk. Except for periods of temporary relief this embargo still holds, which of course places northern manufacturers at serious inconvenience.

Nitrogen and Potash.

More nitrogen was imported last year than ever before, but the excess imports all went into munitions. No relief was offered through ammonium sulphate, since this product was in great demand for refrigating and munition purposes.

The government nitrate purchases for farm use have not yet become a factor in the fertilizer industry, but may become so later.

Domestic potash production made some progress, but the total production was probably not in excess of 150,000 tons, whereas over 700,000 tons of all kinds of potash-bearing materials were used. The alunite workings are being gradually extended and the Searles Lake and Nebraska deposits bid fair to materially increase next season's supply.

Burlap Bags.

As an illustration of the variety of problems presented, I mention the case of burlap bags. Ordinarily no one bothers much about the supply of burlap. Last year prices practically trebled and even at that the supply was limited. It became evident that something must be done to conserve the supply. The industry met the situation by recommending the use only of 200 pound bags, instead of the smaller size, thereby saving some fifteen million yards of burlap.

Considerable effort and publicity was required to show the farmer the reason for the change in size of bags and to get him to accept the larger size.

In the fall, fertilizer men found themselves confronted with the necessity of raising prices for 1918 goods approximately 40 per cent. over those of the preceding spring. Considering the natural caution of the farmer, especially in regard to money matters, the successful handling of this situation presented no small problem. The 40 per cent. increase was successfully negotiated, however, without incurring resentment or ill will. Through the medium of our educational propaganda bureaus—the Soil Improvement committees—the facts were laid squarely before the farmer and he has apparently admitted the justice of the claims.

The fertilizer industry has rendered an excellent service to the railways and to the country as a whole, by educating the trade to order early, and by educating both the trade and manufacturers to handle goods in maximum carloads. Where formerly the average carload of fertilizer was around 17 tons, now it is nearly 27 tons.

Public Awakening, the Greatest Asset.

Various other accomplishments of more or less significance might be chronicled, but to my mind the biggest accomplishment for the fertilizer industry for the war-time period has been something entirely aside from all trade and manufacturing developments. Undoubtedly the biggest thing that has been done for the industry, particularly in the North and Middle West, has been the awakening of a general realization of the tremendous importance of the fertilizer industry, as a factor in food production. This has tended to strengthen public confidence. Farmers and farm advisors are interested in fertilizer as never before, and this interest will develop into heavier consumption in future seasons.

No material improvement in conditions can be expected until the national transportation situation is straightened out. We are assured, however, that throughout the spring months fertilizers will be given preference whenever cars and locomotives are available.

Government requirements of sulphuric acid are now greater than ever before and much of this increase must come from the fertilizer industry. Acid production will probably increase somewhat during 1918, although there is little disposition on the part of manufacturers to further enlarge their plants to accommodate this temporary business, on account of the difficulties in the way of new construction.

Government production of atmospheric nitrogen is expected to be under way within a few months and may relieve the general ammoniate situation to a slight extend by increasing general stocks.

The chief problems of fertilizer manufacturers during 1918 will be those of production and shipping. Consumer demand is good and prices are equitable. Most companies are well supplied with orders, and if a constant flow of raw materials can be maintained and deliveries to farm destinations facilitated, the industry should experience a satisfactory year.

HORACE BOWKER
American Agricultural Chemical Co., New York.

What the Paint Manufacturers of the Country Have Done to Help Win the War

By HOWARD J. GREENE,
Oliver Johnson & Co., Providence, R. I., President.

Howard J. Greene, president of the Paint Manufacturers' Association of the United States, was born in Providence, R. I., in 1876. In 1893 he entered the employ of Oliver Johnson & Co., manufacturers of paints and paint specialties, and became manager of that company in January, 1905. At the time of the incorporation of that company as Oliver Johnson & Co., Inc., in 1913, Mr. Greene became secretary and treasurer.

THE activities of the Paint Manufacturers' Association during the year 1917 were numerous and along exceedingly constructive lines, and members present at the November convention gave their unanimous and hearty support to all proposed changes that might affect the industry.

A War Service Committee picked from the membership by authorities in Washington had been very active since summer and reported to the convention several recommendations from the Commercial Economy Board, which were unanimously adopted by the members present and the co-operation of the entire membership has since been secured. Half-gallon packages will be eliminated after July 1, as also pint cans, from the lines of ready-mixed house paints.

Since this meeting the Council of National Defense, through the Commercial Economy Board, has issued under date of January 21, 1918 a letter containing recommendations that will without doubt be adopted by the industry, and which are intended to effect savings without necessarily working any hardship on the trade.

The War Service Committee has co-operated to the fullest extent with the Commercial Economy Board and proved of invaluable assistance to the board in determining the restrictions which must be placed upon the industry with a minimum amount of inconvenience.

The Federal Trade Commission has for several years been carrying on a propaganda to eliminate unfair competition in trade, and the Paint Manufacturers' Association, together with the National Varnish Manufacturers' Association, have since the first of the year established a bureau to carry on this work, and it is expected that beneficial results to both industries will follow.

Many other committees have important matters under consideration bearing on present conditions and also preparing the industry to best meet conditions that will exist after the war.

Prospects for 1918 are reasonably bright, particularly in industrial centers, although recent reports would indicate that in some parts of the country building is falling off while in others there is shown a tremendous increase. The entire country is more or less inconvenienced because of poor transportation service, and certain parts of the country are seriously hampered because of almost continuous, but evidently necessary, embargoes. The coal situation is, of course furnishing a good share of the hardships, although it is confidently believed that this situation will improve rapidly with the coming of warmer weather.

In conclusion the Paint Manufacturers' Association believes that considerable of their products are necessary and indispensable to the government, and the industry as a whole is conscientiously doing its part to comply with governmental requirements and restrictions, and is also furnishing such products as may be required with promptness and with the feeling that as an industry it is "doing its bit" to bring the war to a successful conclusion.

What the American Chemist Can Do to Offset Foreign-Fostered Prejudices Against American Dyestuffs.

By CHARLES F. ROTH.

THAT the chemist has established for us the American coal-tar dye industry can no longer be disputed; that alone has, in my opinion, established his relation to the industry. There is, however, still much for the chemist to accomplish in the way of publicity to offset and dispel the prejudice of the great public to dyes of domestic origin, or, in fact, any but German dyes, brought about by the insidious reflections of German institutions or people in this country who have led the public thought against the native product, and by native Americans who, misled by these representations, have given disloyal expression to the repetition of such insinuations.

The chemist has produced most of the ordinary and necessary colors for the textile and other industries.

The imminent future of our dye industry is as we know it, but the distant future is in the manufacture of the delicate and varied colors not now made, but which insistent demands require to be made. These must be manufactured more permanent, better and more efficiently than the colors heretofore imported into this country, and their manufacture is the test of no ordinary laboratorian. It requires the fine skill and knowledge of the trained scientist, for he alone will be able to apply the great laws of chemistry that will give to us these products.

The relation of the chemist, therefore, becomes not simply that of the chemist to the coal-tar dye industry, but of physical and theoretical chemistry through the chemist to that industry.

That organization or company which shall the more quickly appreciate the value of chemical theory will be the future originator of the dyes to meet the fastidious demand of Dame Fashion.

In the laboratories of every concern that can afford it—and eventually they will be the big firms—there should be at least one theorist, a pure chemi working upon the great laws of chem istry as they apply to the problems that company to originate new pro ucts, improve old ones, or establi more efficient methods of manufactur

This should be taken to apply n only to the coal-tar dye industry, b to all industry. The work of the the rist may, as has many times be proven, open entirely new fields of e deavor and operation than those t company was organized to enter.

What Have Been the Special Accomplishments in the Surgical Dressing Industry in 1917 and, in View of War Conditions, What Will 1918 Bring Forth?

By HENRY C. LOVIS,
Chairman of Former Committee of Manufacturers of Surgical Dressings, Council of National Defense.

THE beginning of 1917 found the surgical dressings manufacturers of the country facing a steady and increasing domestic demand stimulated by the necessity of dealers replacing stocks that they had allowed to run down and by the increasing prices of all those surgical dressings in which cotton forms the entire or principal part. The new year brought with it the continuation of the volunteer Red Cross work in the production of surgical dressings by Red Cross chapters throughout the country, which tremendously and progressively increased throughout the balance of the year after the entrance of our own country into the world conflict and of itself consumed very large quantities of gauze, absorbent cotton, bandage etc. Large contracts from ally gover ments were substantially complet before the end of 1916, so that it ma be stated there were few if any co tracts with our European ally gover ments uncompleted at the beginning the year. Spanish-American deman continued active; the countries con prised within that designation lookin largely to the American producer f supplies in this line—likewise oth foreign countries formerly tradi with European manufacturers.

Increased Facilities.

Foreseeing the trend of our intern tional relations with the Europe Central Powers and the demands th

DR. HENRY. C. LOVIS
President, Seabury & Johnson, New York.

Henry C. Lovis, the contributor of the above article, first saw the light of da in New York city, August 10, 1870. Manhattan Island has always been his hom After graduating from public school he entered the College of the City of Ne York, leaving it in the sophomore year because too close application to studi made it advisable for him to drop them temporarily, and he embarked in the shi ping and commission business for some two years with the then well-known hou of Chas. P. Sumner & Co., of New York city.

In 1888 at the invitation of his uncle, George J. Seabury, of Seabury & Johnso he began the study of pharmacy and medicine with a view to associating himse with that company, taking his degree of Graduate in Pharmacy, Ph. G., from t New York College of Pharmacy in 1890. He entered the College of Physicians a Surgeons, New York city, in the fall of 1890, from which he graduated in the ye 1893. During the summer months of these collegiate years additional technical a professional skill was secured by laboratory work in the laboratories of Seabu & Johnson and in the Out Patient Departments of the city hospitals.

In October, 1893, full time duties began with Seabury & Johnson at their labor tories in East Orange, N. J., where in the year 1894 Dr. Lovis was made assista superintendent. Upon the death of Alfred Henry Mason, secretary of the co poration, in November, 1896, Dr. Lovis was called to the vacant chair as acti secretary, soon thereafter becoming secretary of the corporation. His work at t laboratories included work in all departments and upon joining the executive forc of the company at the New York headquarters an intimate knowledge and exper ence in the manufacturing end of the business, as well as the technical a professional experience, fitted him exceptionally well for his new duties. Upon t withdrawal in October, 1902, of the then treasurer, G. W. Hopping, the positio of treasurer and secretary were combined, Dr. Lovis filling both, and upon t death of February, 1909, of the founder of the business, George J. Seabury, D Lovis was elected to the presidency of the corporation, in which his uncle h bequeathed him a substantial interest.

During these latter years, in which he has devoted himself more particularly the business end of his company, Dr. Lovis has been active in all movemen looking towards the betterment of the drug trade and active on various committe of the Drug Trade Section of the New York Board of Trade and Transportatio of which he was chairman for two years. Of recent years he has served and now serving as chairman of the Committee on Legislation, being also at prese one of the managing directors of the board. He is and has been for a numb of years one of the Board of Managers of the American Protective Tariff Leagu and is one of the organizers of the American Drug Manufacturers' Associatio formerly named the National Association of Manufacturers of Medicinal Product of which he was treasurer for the first two years and president for the succeedi two years. For a number of years he was trustee of the College of Pharma of the City of New York, of which he is now third vice-president. He is a memb of numerous pharmaceutical, chemical and medical associations and was chairma of the Surgical Dressings Manufacturers' Co-operative Committee of the Coun of National Defense until all such committees were disbanded last fall.

would be made upon them should our own country become involved in the conflict the principal manufacturers in the industry increased facilities to provide for the enormous quantities which would have to be provided in an incredibly short time as against all prior standards of productivity. The events of succeeding months proved their wisdom in placing themselves in that favorable position to render the service called upon them to perform by the Army and Navy Departments, and still render to their buyers of normal peace times the service to which they also were entitled. ad these increased capacities not been provided, much interference, temporarily at least, would have occurred in the continuous supply and distribution of this class of products throughout the land.

Though the foresight of the surgeons general of both the Army and Navy caused them to order and accumulate large quantities of surgical dressings before the advent of the actual declardation of war; these quantities were small when compared to the enormous quantities called for on and after April 6. Too much praise cannot be given to the departments of the Army and Navy advising and controlling the purchase of these supplies for their foresight, their quick appreciation of the necessities of the situation and their thoroughly business-like methods in sustaining the high efficiency of their respective departments in actually providing for and securing a large part of these additional supplies long before their use was possible through actual war casualties.

Group Effort Effective.

The service of the industry to the government could not have been as satisfactorily attained had not all the surgical dressings manufacturers of the country organized as a group and patriotically devoted their every effort to the accomplishment of the war services required. These efforts necessitated changes in general sales policies and the adoption of a policy on the part of the manufacturers to place all civil buyers on substantially a thirty-day basis; in other words, the usual year's contracts commonly made by hospitals, sanitariums and kindred institutions, were impossible to entertain and they as well as the wholesale and retail trade buyers were perforce limited in the quantities they would be furnished. With the difficulties of the transportation situation, express as well as freight, priorities and embargoes, some interference was inevitable in meeting the demands of the consumer, but all conditions considered, these have been kept at such a minimum as not to have caused any very serious embarrassment.

The delays in the filling of civil orders are mostly attributable to transportation delays and hold-ups—delays and hold-ups to the manufacturer in securing his crude materials so that production is interfered with, and delays in the transportation to the buyer after the goods have been shipped. The increased capacities above referred to would fulfill every requirement of the civil buyer were transportation conditions only normal.

Advance in Cotton Cost.

The steady advance of the cotton market throughout 1917 and other elements of increased costs forced increased costs of surgical dressings in which cotton forms the entire or chief part, and as these continued to rise, general advances throughout such lines were issued from time to time.

These conditions will continue until the new cotton crop is marketed and while the war lasts. Should peace be made before the new crop is available, further increases in prices are to be expected.

The special accomplishments in the surgical dressings industry in 1917 I would state were the organization of the whole industry in a group for war service, the large increase in productive capacities of regular trade packages required by the government, the establishment of special departments devoted to the production of special packages needed in the war, and the adjustment of trade distribution of surgical dressings to accommodate the national needs.

The present year opens with the same conditions prevailing as during the latter part of 1917, and should the war continue the manufacturers of this class of products will be found devoting a large part of their capacities to the needs of our own army and navy and serving our allies as they may require, with sufficient besides for the care of their home and foreign trade.

What the N. W. D. A. Is Doing to Bring the War to a Successful Conclusion—The Adjustments of 1917, the Results of 1918.

C. E. BEDWELL,
President, National Wholesale Druggists' Association.

WHAT the National Wholesale Druggists's Association is doing to end the war is, perhaps, what every loyal organization and individual have uppermost in mind—the employment of every means at command to terminate the struggle in victory for the cause of humanity, the freedom of sane speech and proper action of every subject of democracy.

Several months ago the National Wholesale Druggists' Association appointed a committee to act under direction of the National Council of Defense, and at the convention in Chicago in October last this committee, in special session, was continued with F. E. Bogart of Detroit as its able chairman. The services of the committee, now known as the "War Service Committee," were at that time tendered to the government; and those who know the personnel of the body have every confidence that the co-operation will be whole-hearted and intensely patriotic. I am sure that any recommendation that may be made by this committee, through its chairman, will meet with ready and hearty response.

Aside from what the N. W. D. A. may do through its committee, every wholesale druggist in the United States carrying a membership in the N. W. D. A. is lending individual aid by buying Liberty Bonds and Thrift Stamps for himself and his employes, contributing regularly and liberally to various funds that are used for the physical comfort and the moral welfare of the splendid young men who are pledging their lives, if necessary, on results that are sure to be realized, and which will immortalize them and at the same time bring added luster and honor to our flag.

No Profiteering.

The wholesale druggist has, with honest intent, conducted his business of the past year in a manner to bring the largest returns, without laying himself open to the odious charge of profiteering, knowing that he would not have left, after paying various taxes, more than an average surplus to be used to meet his requirements and increase his capital, made necessary by heavier investments because of prices being abnormally high. In the result he takes both pride in the accomplishment and pleasure in being able to stand proudly behind his government as a real and effective support.

Throughout the country men of the N. W. D. A. have placed their affairs in the hands of others and are giving their services to the government. So it can be said that our association is doing its full part toward bringing the war to a successful conclusion.

The adjustments of 1917 came so gradually as to have been almost automatic in their action, so far as changes in market quotations could make them. It is an easy matter to adjust prices to meet changing conditions, especially when we are doing business on even a slightly advancing market, such as we had last year. True, some articles, notably in the chemical line, showed a lower level of values throughout the year, and especially in the later months of it, but the changes came at a time when stocks were low and the declines were met without loss of any consequence.

Enlistments and the draft have left the trail of their demoralizing effect in the organization of every house, and for this wholesale druggists were not any better prepared than was our country when war overtook it. But with the spirit to win and stand shoulder to shoulder with home warriors, gaps have been filled by the transfer of men to other positions and whose former places have been supplied with inexperienced men. This adjustment of forces has enabled us to keep business moving, though with somewhat less speed and accuracy.

Cutting Down Expenses.

Influenced by an economic viewpoint, prompted by the request of the government that every one save that he might contribute more to the support of various war activities, the members of the N. W. D. A., in some sections at least, have turned their attention to the wiping out of some of the expenses and drains of their businesses, through the reduction in number of city salesmen, fewer deliveries, elimination of messenger service, more prompt payment of bills, holding the discount period to ten days or two weeks, requiring the return of goods within thirty days if for any reason they are not satisfactory to the purchaser, etc. These things are small, when considered individually, but in the aggregate amount to considerable, and, added to the saving by numerous means that are being employed by other lines of business, make a no mean contribution to Uncle Sam's cash box. These are adjustments that should be universally made, and they could be without imposing upon the customer any requirement which he could not conveniently respond to.

The results of 1918 can only be predicated at this time. If we knew that the war would end in the next two or three months, I could with some degree of satisfaction, to myself at least, form conclusions on which I would be willing to base my action; but, with indications of war more intense than ever, for at least another year, I think we can only "sit tight," keep our heads, and base our actions on the best judgment that can be used to meet varying conditions. It is my opinion that as reserve stocks, bought at low figures, have been exhausted, profits will be more nearly normal, and, therefore, neither we nor the government can hope for the returns of 1918 being near those of 1916 and 1917; and it would appear the part of wisdom to keep close to the shore in all our business activities. Of course, we may find it advantageous to carry fair stocks in the chemical and pharmaceutical lines, even anticipating our future needs, as these industries probably will be affected more than any others by the demands of the government; and it would not be surprising if this requirement should make it difficult to obtain needed supplies.

We are now entering on the fourth full year of the war. It may be the last. Facing its termination, I believe it would be the part of wisdom to be conservative, that the year at its close may find us better prepared to step down to a peace level.

What the National Paint, Oil and Varnish Association Is Doing to Bring the War to a Successful Conclusion—The Adjustment of 1917, the Result of 1918.

By GEORGE C. MORTON,
President, National Paint, Oil and Varnish Association.

PAINT and varnish men are not different from those engaged in other industries in not desiring to talk about what they do along patriotic lines. They are not seeking credit for that kind of work, so no definite report or exact figures are available as to results actually accomplished by our members. From personal knowledge, however, I think I am safe in saying that the members of our association have shown loyalty and devotion to the country not surpassed by that shown by members of any other national trade body.

As an example, one has only to recall our War Convention held in Chicago October 8, 9 and 10, 1917. The keynote of the convention was:—"Service to country." It was a patriotic convention. The patriotism reached a high point on the first day, when the former president of the Chamber of Commerce of the U. S. A., Harry A. Wheeler, delivered his splendid address on "Food Conservation," and it culminated in a wave of enthusiasm when the war resolution was introduced on the afternoon of the last day and unanimously adopted.

The roll of honor read at the convention, while incomplete, indicated splendid contributions already made to men to the service of our country. This is supported by a glance through the offices or factories of any of our members. Here men of military age are conspicuous by their absence. Men not eligible for military duty and women are performing the work.

In nearly every city where there are local paint and varnish clubs, we find the members of these clubs taking active, if not leading, parts in Liberty Loan, Red Cross, war camp fund and Red Triangle Y. M. C. A. campaigns.

I also know that many of our members are bringing to the attention of their employes the War Savings Stamps by issuing thrift cards, with one thrift stamp attached, to each employe in order to start him to saving his money and loaning it to the government.

Wives and Daughters Active.

The wives and daughters of our members are also doing their duty. I personally know that the wife of one of our loyal members (a white lead manufacturer) is general manager of the Red Cross headquarters in the city where they live. This patriotic woman leaves her home every morning at 8.30 a. m., returning at 5 p. m. During the day she superintends the women workers in that city who give their time free to making of bandages and doing other Red Cross work.

When I assumed the office of president of our association, I pledged myself to make an earnest effort to be alert to every opportunity for our association to render service to the government. My first duty was to appoint a War Service Committee.

I selected for this committee men thoroughly representative of every branch of our industry, as follows:—

E. J. Cornish, chairman, and W. H.

CHARLES EDGAR BEDWELL

Charles Edgar Bedwell, president of the National Wholesale Druggists' Association, has been associated with the wholesale drug business since March, 1879. He is a native of Iowa, and began business in Ottumwa, March 24, 1879. In December, 1886, he went to Omaha to associate himself with the Blake, Bruce Company, and when, in 1896, the firm was incorporated, he became secretary and treasurer; later he was made vice-president, and since 1901 he has been the buyer of all goods for the house, except sundries. He has served the National Wholesale Druggists' Association in many capacities.

Cottingham, James B. Lord, Charles J. Caspar, A. S. Somers, W. D. Foss and Howard Kellogg as associates.

This committee has organized for work and has appointed as secretary, Charles B. Field, who will reside in Washington, so as to keep the committee promptly advised on ways in which they can render service to the government.

Direct Aid to Government.

Through the medium of this committee, the War Board at Washington has asked our association to aid the government in the following ways:—Conservation of food, fuel, power, material; standardization of paint and varnish products so that there may be a recognized standard of quality on the various products purchased by the government; this involves many changes in the government specifications heretofore used for these products; transportation; supplying the government with executive and trained men; co-operation in War Savings Stamps and future Liberty Loan campaigns. These requests have only just been received, but pledges from among our members have already been made that mean the reduction of the consumption of coal and conservation of material by means of reducing the number of colors and sizes of house paints, wall paints, varnishes, etc. Ways and means of rendering aid to the government in all ways requested are now being considered.

Following immediately after the specific requests of the War Board, we have had the order promulgated by Fuel Administrator Garfield in regard to closing down of all industries east of the Mississippi River for a period of five days and also on Mondays until April 1. I am sure this request will be cheerfully obeyed by all manufacturers among our members.

I think the hardest readjustment that our members have had to make during the past year and the one problem that will be most difficult to solve during the coming year is the matter of supplying workers to replace those called to the colors.

Education of New Workers.

The problem of educating the new workers so that they will be able to perform their duties in an efficient manner is a difficult one and will continue to be so long as the war continues.

The readjustment of prices during the past year has not occasioned much inconvenience because, in most cases, the prices have steadily advanced. It is always pleasant to sell goods on a rising market and the margin of profit has been good. This has enabled business houses to add substantially to their capital and surplus during the past three years.

It is fortunate that good margins of profit have been made for the reason that inventories taken at the close of 1917 show stocks of merchandise valued at from 50 to 60 per cent. larger amount than at the close of 1916, and more capital is needed to carry stocks of merchandise and book accounts on account of the great inflation in values.

As regards the result for 1918, I think the outlook is very bright indeed. I believe that our factories will find they will have all the business they can do with the labor available.

I feel that it is the duty of all those remaining at home to work early and late and keep business amoving.

I do not think we should have in mind that we are pushing business for a profit or for the benefit of our employes, but I feel that we should all keep in mind that the one reason we are pushing business is for the support of the government.

The sums of money that will be required this year to finance the war seem tremendous, but many hands make light work, and if our business men are active and our wage earners diligent, we shall be able to furnish to our government the money needed and the aid, without which our young men cannot be successful in the field.

GEORGE CARPENTER MORTON
Carpenter-Morton Co., Boston.

George Carpenter Morton, president of the National Paint, Oil and Varnish Association, was born in Boston, Mass., September 23, 1868. He has been identified with the paint industry since 1887. He began with Carpenter, Woodward & Morton soon after leaving school, and for 10 years after 1889 traveled for this firm. In 1892, when the company became a Massachusetts corporation, under the name of the Carpenter-Morton Company, he became a director, and in 1899 became treasurer and general manager.

He has served as president of the Paint and Oil Club of New England, president of the Boston Credit Men's Association and director of the National Association of Credit Men.

What the Proprietary Association Is Doing to Help Win the War

By FRANK A. BLAIR,
President, Proprietary Association.

PACKAGE medicines are largely manufactured as a hand process. The laboratories and workrooms of these manufacturers are not equipped with much machinery. We have not, therefore, found ourselves in a position to take much of a part in the manufacture of war-making materials. We have done what we could in the way of manufacturing tablets and articles in our line required by the government, and so far have filled all requisitions made on us and stand ready to do more whenever required. But the war bills must be paid, and in this respect we are doing at least our full share. In the first place, we are one of the few manufacturers on whom the war revenue bill imposed a gross sales tax—we paying 2 per cent. on our sales volume. Practically all medicine manufacturers use alcohol at some stage of their process, and the war tax on alcohol amounts to about $2.09 per wine gallon. The revenue bill, in failing to recognize as an asset the value of a trade-mark brand or good will, imposes a greater tax on us than on other manufacturers, so that in comparison with the volume of our business we are doing more to pay the war bills than any other line of manufacture.

Individuals from our line of business have taken very active parts in Red Cross and Y. M. C. A. work, both at their homes and in Washington. They have also given their time in other ways to the support of the government in this time of stress.

Our people have purchased Liberty bonds and war savings certificates to the limit of their capacity, and have been instrumental in securing distribution of this paper among their employes. Our rapidly growing "roll of honor" shows, I believe, a very high percentage of enlistment from our small group. Further calls will no doubt be made on us and when these calls are made the Proprietary Association will not be found lacking.

What the Linseed Association of New York Stands For—Its Aims and Accomplishments.

By GEORGE W. FORTMEYER,
President.

THE Linseed Association of New York was organized in 1867 by the crushers of linseed oil principally, and the importers of linseed for the purpose of safeguarding the interests of crushers as to the quality of seed and other conditions growing out of the business.

It was found that the bazaars of India were very careless in preparing the several grades of seed which gave rise to a great deal of dispute between buyer and seller and led in consequence to the organization of the Linseed Association.

The oil manufacturing business of the country at that time was done entirely by Eastern crushers and the seed used was from Calcutta and Bombay. No importations were made direct by crushers and their supplies were furnished entirely by importers who at all times carried from 250,000 to 300,000 bags in warehouses in Brooklyn.

Entrance of the Argentine.

About the year 1880 the Argentine Republic began to develop as an agricultural country and in its very phenomenal expansion in this direction the growth of linseed was increased from very small beginnings until it has reached in some years as high a volume as 40,000,000 bushels. Crushers in this country, however, did not use La Plata seed unless supplies from India were shorter than their requirements. The use of La Plata seed, however, was very slight, because about the year 1870 the American crop of flaxseed began to develop to proportions which commanded the attention of Eastern crushers, and as soon as the crop had reached a volume where it made itself an important factor in the business it entered very largely into competition with India seed, both Calcutta and Bombay, and grew in use with the crushers very rapidly. This, of course, led to the development of the crushing industry in the West, and until this growth of the American crop the entire crushing interests in linseed oil were mainly sustained by the India and La Plata crops.

Dwindling of India Imports.

This brought about almost entirely the cessation of importations from India, and the only demand for Calcutta and Bombay seed oil was from those who required them for special needs. The business of crushing linseed oil, therefore, which was originally done with India seed, is now carried on entirely with American seed, except at such times as the domestic crop is too short and then the deficiency has been made up by importations from the Argentine.

During all of these periods the Linseed Association has served the crushing interests as originally designed, and during the past ten years, owing to the increased consumption of other vegetable oil seeds which have entered into more general use, the association has broadened its aims and has taken on the work of analyses of such seeds, as well as castor seed. For many years past it has been recognized by the United States Government as authority for analytical work in oil seeds and its certificates have been accepted on all importations.

Activity Since the War.

Since the present war it has enlarged its facilities for government needs in the matter of statistics and co-operative work in importations. It has membership in the United States Chamber of Commerce and in the Merchants' Association of New York city.

The Linseed Association of New York is also in official correspondence with the Incorporated Oil Seeds Association of London, the contracts of which association have always been recognized as the standard by the importers and buyers of linseed throughout the world.

Contracts Are Standards.

By reason of our official connection with this corporation, the Linseed Association of New York also have their contracts recognized as the standard for all business done in these foreign seeds in the United States and during this war, owing to larger importations of La Plata seed here, our association is co-operating with the Incorporated Oil Seeds Association of London forwarding samples of seed to establish the average standard sample in Lon-

GEORGE W. FORTMYER.

George W. Fortmyer, the dean of the white lead trade, has been 62 years in active service. He is a director of the National Lead Company and assistant manager of the Atlantic branch. His first position was as office boy with Robert Colgate & Co. He remained with this firm and its successors until a merger of different companies resulted in the formation of the National Lead Company. He was one of the original founders of the New York Paint, Oil and Varnish Club, of which he was president in 1895-1896. He was one of the founders of the Linseed Association of New York, and has held the presidency of this body since 1901.

don, which has always been recognized as the basis of all contracts as to quality of seed.

The Linseed Association has at all times been in touch with every modern development on the commercial lines in which it is interested and has placed itself in a position to be available for all work which would naturally grow out of its organization. Its membership consists of nearly all of the crushers in the United States, as well as importers of linseed and other oil seeds, and at no time has it been in a stronger position for effective work in all the interests it represents.

What the National Varnish Manufacturers' Association Is Doing to Help Bring the War to a Successful Conclusion.

By J. B. LORD,
President, National Varnish Manufacturers' Association.

THE National Varnish Manufacturers' Association is co-operating in every possible way with the different committees at Washington. A special committee representing the paint and varnish industries has been appointed to confer with the Fuel Board at Washington and work out some plan whereby these industries will cut down their use of fuel of all kinds.

A committee has also been appointed to confer with the War Economy Board at Washington and arrange to cut out certain size packages and also cut out certain grades and brands for the duration of the war, thereby saving labor, material and allowing the retail dealer to carry less stock.

Several members of the National Varnish Manufacturers' Association are already serving on different government committees, and many employes and other persons connected with the trade are in actual government service; and I am sure that all the others are ready and willing to do everything they can to help the government in every way to win the war as quickly as possible.

J. B. LORD

What the American Drug Manufacturers' Association Is Doing to Help Bring the War to a Successful Conclusion.

By CHARLES J. LYNN,
President, American Drug Manufacturers' Association.

IN seeking an answer to the question "What Is the American Drug Manufacturers Association Doing to Bring the War to a Successful Conclusion?" you give me a task to which I am unequal. I can only attempt to answer your question by asking you a few of my own.

To begin with—can you imagine what would be the situation if the government did not have at its command the facilities of the laboratories of the members of this Association? Where would the supply of surgical dressings come from if it were not for the members of this association? The women of this country, as enthusiastic in their patriotic service as they are and mobilized as effectively as they are throughout every section of the country under the direction of the American Red Cross, could not begin to supply the demand for such products as come from the medical departments of the army and navy.

Where would the tremendous supply of biologicals come from if it were not for the commercial laboratories represented in the membership of this association? These products furnish the army and navy medical officers with their very strongest and most effective weapon in the prevention and treatment of diseases which, without them, would devastate our fighting forces, and State and Federal laboratories could not possibly supply the demand.

Where would the medicinal chemicals come from which are required in such enormous quantities to meet the demands of the medical supply department of the army alone if it were not for the chemical houses represented in our membership?

Where would the government find pharmaceutical laboratories to convert these medicinal chemicals and other raw materials into the finished fluid extracts, tinctures, tablets, hypodermic tablets, pills, elixirs, etc., if it were not for the pharmaceutical members of this association?

In fact, if it were not for the members of this association how could it be possible for the medical officers of the army to put back into fighting trim the man power of the army laid low by wounds and disease?

In addition, I might say that our members are loyal supporters of the Liberty Loans, they are boosting the sale of War Savings Stamps and organizing thrift clubs among their employes; they observe in their homes all the regulations of the Food Administration, they have cheerfully given their sons and many of their valued employes to the service of their country, and last but not least, are preparing to bear their share of the very unequal burden of taxation placed upon the drug trade.

CHARLES J. LYNN

Charles J. Lynn, president of the American Drug Manufacturers' Association, and of its predecessor, the National Association of Manufacturers of Medicinal Products, has been identified with the drug industry for more than 20 years wth Eli Lilly & Co. of Indianapolis. He joined the sales staff of that company in 1896, when he represented the Red Lilly in New York and Pennsylvania. When Lilly inaugurated its Eastern branch in 1902 Mr. Lynn was made manager, and so successful was his work that he was promoted to manager of the company's sale department, with headquarters at Indianapolis, in July, 1906. In January, 1907, he was made general manager of the business. Mr. Lynn was one of the organizers of the N. A. M. M. P. in 1912, and has since been prominent in the councils of the organization. He is a ative "Hoosier," and was born in Indanapolis in 1874.

What Have Been the Special Accomplishments in the Pharmaceutical Industry in 1917 and, in View of War Conditions, What Will 1918 Bring Forth?

WILLARD OHLIGER,
Vice-President and General Manager, Frederick Stearns & Co.

BEFORE the outbreak of the European war in 1914 conditions in the drug trade were generally normal. These were rudely upset upon the outbreak of hostilities. Many purchased stocks above normal requirements in order to protect themselves, in part at least, for the duration of the war, which it was thought would last some two or three months; within a few days prices soared, in some instances doubling over night, and available supplies of many kinds were practically depleted.

After a time conditions and prices became more stable and by 1917, although prices of many commodities were from 100 to 1,000 per cent, higher than early in 1914, some items were not plentiful, freight traffic was bad, the labor market somewhat short, production problems greater than previously, nevertheless the general volume of trade as measured by sales was

WILLARD OHLIGER
Frederick Stearns & Co., Detroit

greater than ever before in the history of pharmacutical industry.

Crude Material Cost.

The cost of crude materials of all kinds in all lines of business was very high, as compared with before the war prices; however, those prevailing on December 31, 1917, on a large number of drug and chemical items averaged about the same as in May, 1917.

During the past year the pharmaceutical industry had a big task to perform in providing the government with tremendous quantities of supplies. It first assisted the government in standardizing its pharmaceutical requirements and advised it, through its committee, acting as a sub-committee of the Council of National Defense, on the best ways and means of obtaining supplies.

The government lists of materials for the army called for enough medical supplies to maintain 1,000,000 men for one year. The committee advised that the amount be divided into a number of allotments going out at specified periods, so as not to send prices up by the purchase and withdrawal of such great amounts of drugs and chemicals at one time.

Competitive Bids for U. S. Needs.

These lists were sent out to manufacturers, all of whom were privileged to bid by merely registering their name with the proper division of the army and navy and contracts were awarded to the lowest bidder. Contracts thus awarded have been delivered to the government by the pharmaceutical manufacturers in amounts to take care of the medical requirements of a million men for one year. In consequence of this method of competitive bidding, the government has purchased its pharmaceutical needs at fair prices and practically no confusion has been created in the trade. Actual figures show that the government paid less for the second award of contracts than on the first, and the tendency has quite uniformly been towards a shading of prices on successive bids. A comparison of prices, item for item, of crude drugs and chemicals used in large amounts by the government shows that prices now are within 1 per cent. of what they were in May, 1917, or before the first bids were called for.

Some time ago the government offered to turn over to American manufacturers under a licensing system, the use of many German patents covering medicinal compounds. We understand that a few of these of American manufacture will shortly be produced and on the market.

Domestic Products Developed.

Many crude articles formerly imported from Europe are now manufactured or produced in this country and in larger colume than formerly imported. Although the government now permits the use of German patents, there are but few of them that are really necessary, since we have equivalents manufactured here at home that are as good, or even better, than the patented articles.

Many of the foreign drugs that we have come to consider almost indispensable through years of familiarity and use, are no longer being imported. Attempts have been made to cultivate certain ones in this country and considerable progress has been made.

While no one knows what the future may have in store, indications point to big business for 1918. In any case the pharmaceutical industry can be relied on to meet problems in 1918, although they may be of different nature, with the same confidence as they successfully met them in 1917, barring, of course, unforeseen difficulties over which it is beyond industry and science to exercise control.

business men, that even those liberal attempts at adjustment which were made during the year have been found, at its close, to be inadequate, and that there is still reason to contemplate, with some misgiving, the necessity of still further adjustments to meet the conditions above indicated.

The results of 1918, in my judgment, are likely not to prove satisfactory to any of us; for, while not inclined to take a pessimistic view of anything, still we cannot help realize that we still are working under abnormal conditions, which, with each day, become more pronounced. Nor is it conceivable that, while the bloody contest continues, it will be possible for business to assume a different role. Hence the writer believes it will be well for all of us in this year upon which we have just entered to be extremely thoughtful and careful in the matter of expansion as well as in the matter of commitments, and, if we will keep these thoughts in mind, it is the writer's opinion that, notwithstanding the abnormalities of the day, we should be found reasonably well prepared to meet the new conditions which must inevitably confront us at the termination of the world conflict.

What the Independent Oil Men's Association Is Doing to Help Bring the War to a Successful Conclusion.

By M. J. BYRNE,
President, Waterbury, Conn.

THE Independent Oil Men's Association, as such, is hardly in a position to contribute in any large sense to either the prosecution of the war or to the amelioriation of those conditions which are necessarily attendant upon it, but so far as what can be done according to the lights of the officers and directors of the association, each one vies with every other in the patriotic desire to assist those who are engaged in the most humane cause of human history. We subscribed out of our funds for Liberty Bonds to the full extent of our treasury capacity, and advise our membership to conform as nearly as possible and as cheerfully as can be to those rules and regulations which already have been or which may be hereafter promulgated by proper authority to aid or simplify the serious work in which we have become interested in the Godly cause of distressed people, and we are assured, that those who are engaged in the independent oil industry will manifest a patriotism worthy of them.

In my judgment the independent finds, probably no different from other

M. J. BYRNE.

M. J. Byrne, president of the Independent Oil Men's Association, is also the president of the Connecticut Oil Company of Waterbury, Conn. He was born in Ireland, October 3, 1872, and received his education there. Coming to the United States, he entered the Yale Law School and was graduated in the class of '95.

Mr. Byrne is a member of the Connecticut Bar, and for two years served as a probate judge.

He established the business of the Connecticut Oil Company, and is also president of the National Company of Waterbury, makers of metal tubing. Prior to his election as president of the Independent Oil Men he served on the Executive Committee of the Independent Oil Marketers' Association and as a director of the I. O. M. A. He also served as vice-president of the latter body.

A Review of the Natural Dyestuff Situation

By C. R. DELANEY
J. S. Young & Company, Hanover, Pa.

IN reviewing the dyestuff industry for the past year the mind of the reviewer is struck by what might be called the differences in alignment of the very large manufacturers of dyewood extracts; that is, the differences in the situation existing prior to 1914 and that obtaining at the present time.

In 1914 there were four well-known manufacturers of logwood extract and three equally well-known manufacturers of quercitron bark extract, with the usual number of smaller concerns who neither by output nor quality affected to any considerable extent the dyewood extract business taken as a whole. The first result of the cutting off of German imports of artificial colors was to immediately stimulate the use of natural dyes, and then, much to the gratification of the manufacturers of these materials, it was found by a very large number of consumers that not only could they use the natural products for their own purposes, but in a number of instances, noticeably in the woolen and worsted lines, there were very many and marked advantages accruing through their use. The result of this stimulation of demand acted in a peculiar manner upon two of the new powerful interests making logwood extract. At Baltimore, Md., and Camden, N. J., there were two enormous extract works manufacturing licorice, which was then imported from Southern Russia and the Turkish Empire. Promptly upon the closing of the Dardenelles shipments of raw material almost entirely ceased ,and it is only with utmost difficulty that the precarious supply is secured from Russia, Spain and Italy. This in turn immediately cut down the output of finished material, and these two plants immediately had their attention drawn to the possibilities of manufacture of logwood extract, both being on seaports, and the Baltimore plant being nearer to the source of raw material supply than any other factory. What has been the result is that these two concerns, with the addition of a third at Lynchburg, Va., immediately shot into prominence as powerful factors in the logwood extract situation, so that there are today seven manufacturers of logwood extract of international reputation, and the latter three that we have mentioned bid fair to continue in the logwood extract business for the time to come.

There are four or five other plants producing logwood extracts today, but the majority of it is for export, and here a word of advice might be offered. It is a well-known fact in the dyewood extract business that the large majority of exporters of dyewood extracts are not purchasing the high grades, but are endeavoring to secure material whose quality has been brought down to fit a price. This is an unfortunate thing for the dyewood extract business, or for any other business, for with the prevailing rates of export freight it makes very little difference to the ultimate consumer whether he pays a few cents more per pound for his material, whereas it makes a tremendous difference in the quality.

C. R. DELANEY
I. S. Young & Co., Hanover, Pa.

C. R. Delaney, the writer of the above article, was born in London, England, in 1876. He came to the United States in 1889, and became a naturalized citizen in 1898. Mr. Delaney studied chemistry at the Cooper Institute, New York, for five years, and since that time has devoted himself to chemical pursuits. He was a chemist for the United States Government for four years, a teacher one year, and has been the chemist of J. S. Young & Co. and allied interests for the past 15 years. He is a member of the American Institute of Chemical Engineers, the American Chemical Society and the Chemists' Club. His home is in Hanover, Pa. Mr. Delaney writes that his hobbies are amateur clock-making and Egyptology, and that his pet horror is government exponents of sound knowledge when the knowledge consists mostly of sound. His favorite study—he admits this himself—is the chemistry of natural dyestuffs.

Quercitron Bark.

Changing to the subject of Quercitron bark extract, which has been continuously produced in this country since 1869, and which, as far as the writer's knowledge extends, is the only large source of yellow dyestuff growing north of the Mason and Dixon line, this seems to have come into its own. With the increasing difficulty of importing fustic, and the fact that Quercitron bark extract, when it is properly used, will completely take the place of fustic for greens, drabs and blacks, there has been a tremendous stimulation in the use of this latter material, and, in fact,

our American produced Quercitron bark extract and Osage orange can be used to entirely take the place of fustic, the Osage orange having its particular uses in the paper staining and leather industries, and the Quercitron for the textile and wall paper lake manufacturers.

Naturally, there has been some confusion about the use of these two materials, and a great many unwarranted statements have been made by the Osage orange enthusiasts, some of which have not been backed either by experience or knowledge, and, furthermore, its cost is against it, as compared to the Quercitron. This year, 1918, has seen the production on an experimental scale of natural dyestuffs which bid fair to replace the synthetic colors in certain places where they have formerly been considered to be paramount. In practically every instance where the natural colors were required to be fast to light, washing and fulling, it was almost necessary to mordant the materials that were being dyed, which naturally necessitated the use of two or more baths. With an altogether new process in the manufacture of dyewood extracts this difficulty has been overcome, and in a rather ingenious manner.

Natural Dyestuffs in Deep Shades.

Taking it for granted in the first place, that alizarine was artificial matder, and in the second place that madder could be used for dyeing only one base color, and then in conjunction with a mordant, and, thirdly, that alizarines could be made synthetically so that they would not require the secondary mordant and could be changed almost at will, through the knowledge of the manufacturer, to a large range of color, one of the dyewood extract manufacturers has seemingly reversed this order, and is commencing to manufacture natural dyestuffs of the usual deep shades, such as green, olive drab, blue and black for wool and worsted that require no mordants, and nothing but a single bath for the dyeing. This is somewhat revolutionary, and it seems as though these dyestuffs would take their place in conjunction with the artificial colors, and it is not impossible to say that they will take the place of the artificial colors to a considerable extent.

New Line of Dyestuffs.

It will be seen by the foregoing that the natural dyestuff industry has accomplished two things in the past year. It has settled down to a normal business of manufacture controlled by powerful financial interests, which latter interests are not from the outside, but are actually engaged in managing and directing their own factories, which naturally tends to stabilize and conserve under any and all conditions the resources of those who are engaged in the work, and the second and most important thing is that the dyewood extract manufacturers, no longer content with the products that have been produced by them, have engaged the best scientific talent possible to secure, and have worked out an entirely new type of dyestuffs which should be justly considered as one of the greatest American achievements of this century. Without any undue reflection upon the synthetic dyes, a brief resume of their manufacture will disclose that they were invented in England, developed in France, perfected in Germany and imitated in the United States, whereas the natural dyestuff industry has held its own in the United States, and has grown stronger in itself, and more elastic in its ability to supply the requ rements of our dye houses, and, furthermore, has always been able to produce dyestuffs superior to any of a similar type manufactured by the foreign imitators. There is no country in the world that has as much capital invested in the natural dyestuff industry as the United States, not as far as the writer's knowledge extends, has this ever been.

WHAT THE INDEPENDENT OIL PRODUCERS AND REFINERS HAVE DONE TO HELP WIN THE WAR.

By H. G. JAMES,
President, Western Refiners' Association.

IN reply to your question:—"What are the independent oil men doing to help w.n the war?" I might say in all truthfulness, everything they know how to do. First and foremost:—They have been good. By that I mean they have pushed the operat on of their business to the highest degree of efficiency. They have increased the output of their products. They have kept prices within reasonable scope of increased cost of production. They have in no way profiteered. They have reduced the cost of operating their plants as far as possible. They have tried to make the best of war conditions. And they have not compla ned.

Isn't that a good record? Except for filling more space, I might let the subject go at that. But there is really more to say and it is important that it should be said.

Paralyzed Industry Averted.

Last summer when the food control bill was before Congress provision was made in it for governmental administrat on of pipe lines, refineries and the sale and distribution of refined products. It was a drastic bill and would have paralyzed the oil business. Credit for elimination of all these obnoxious provisions, save reference to fuel oil, is due the Independent Refiners' Associat'on of the Mid-ontinent field. That was one of the best things done last year toward the winning of the war, so far as oil is concerned. I contend that it was as important to the government as to the oil industry that interference with the production and manufacture of petroleum be averted. And now at this time the independents are striving to prevail upon official Washington to keep hands off the oil industry. Not for the sake of the industry alone. That would be selfish. But for the success of the war. There is the possibility we may be mistaken. But there is the history of the world to support us.

Effect of Contest.

There is the history of everything the government has attempted to control s nce the war started. In every instance there has been a decline in output. It is recalled that during the French revolution the government attempted regulation and the result was soaring prices and increased scarcity. Mayors French towns were assassinated in riots over the shortage of sugar. Coal was also short. Then came Napoleon. He sized up the situation and removed all the restrictions and embargoes, and, lo! soon was there enough for all.

We verily believe that the chief reason there has been enough oil products to meet all demands is because there has been no official interference with the oil business.

Production in Seven Years.

Let us review the past few years Here are the production figures:

Year.	Bbls. prod.
1911	220,449,391
1912	222,035,044
1913	248,446,230
1914	265,763,535
1915	281,104,104
1916	300,767,158
1917	341,200,600

The figures for 1917 are part'ally estimated, but they are supposed to be approximately correct. It will be noted that in 1912, when there were no new pools and the famous Glenn pool had subsided to the routine of a pumping proposit'on, there was an increase over the previous year in crude production of only 2,485,653 barrels.

In 1913 the shallow sand wells of the great Cushing pool were drilled and there was an increase that year over 1912 of 25,511,168 barrels. It is worth while to observe in this comment that with the exception of last year there was a greater increase in new production the twelve months before the war year than in any subsequent year, and at the same time that was not the big year of Cushing. Cushing reached its maximum output during the first half of 1914, when the daily yield of the Mid-continent field exceeded 400,000 barrels a day, a mark not again reached until 1917, or the year the United States entered the war and a call for more oil was sent out. The figures for 1914 show an increase over 1913 of only 17,317,305 barrels. This was the first year of the war.

Over-Production First War Year.

During this year there was a fearful over-production of all petroleum products. Crude sold at the wells as low as 23 cents a barrel; fuel oil went begging at 25 cents a barrel; gasoline touched as low as 5 cents a gallon and kerosene sold at 1 cent a gallon in tank carlots. Millions of gallons of these products were held in storage, more than 60,000,000 gallons of kerosene and almost as much gasoline. When refiners could store no more they asked and received permission of jobbers to ship gasoline to their tanks and store same until the jobber could use it, and then the jobber paid whatever price could be agreed upon. That was the jobbers' heyday. It was a period of chaos in oildom. But Cushing could not last. It went down faster than it came up. After a few months South Cush ng and then North Cushing were developed and 1915 showed an increased production over 1914, but reduced to 15,340,569 barrels.

H. G. JAMES
President, Western Refiners' Association.

1916 Activities.

During 1916 there was considerable activity in wildcatting and the Kansas deep sand at Augusta and Eldorado was discovered. The increase over 1915 was 19,663,054 barrels.

But in 1917 the United States became involved in the war. The year was young when the break came. The word went out that the government would need all the oil the industry could produce. The price of all material advanced with alarming strides. Labor came in for its share, and instead of operating refineries with two shifts, it became necessary to operate on three shifts, at largely increased salaries. Everything about producing and refining increased in cost. Wild reports were circulated that because of inability to secure casing and because of high prices drilling was being discontinued and production was falling off alarmingly. I have an article before me, written at that time, in which I said:—"These statements are not true. They are published for a purpose." And they were not true, as subsequent results proved. It was also heralded far and wide that there was going to be a shortage of gasoline and that the use of gasoline in pleasure cars should be curtailed. My reply to this was that it would be the worst kind of a mistake to curtail the use of gasoline in pleasure cars, as there was going to be all the gasoline needed. Curtailment of gasoline would upset the whole industry. These declarations proved true.

Big Production Increase.

In 1917 we increased the production of crude over the output of the previous year 40,433,442 barrels, according to the reports available for last year. This was the largest increase of new production ever known in a single year and in spite of all kinds of pessimistic reports and against all sorts of difficulties. At the same time we made remarkable strides in refinery efficiency, increasing the precipitation of gasoline from crude on an average over the United States several per cent. There is no way of ascertaining just what the increase was, but it was five per cent. or more. That is a wonderful showing. It was officially estimated in 1916 that the average yield of gasoline from crude over the United States was 15 per cent. Now it is over 26 per cent. How much of the increase was creditable to 1916 and how much to 1917 I am unable to say. Today there is a surfeit of gasoline, and refineries are running 50 per cent. short of capacity.

Spectacular Progress in 1917.

The point I am making is that the oil industry, against great odds, made in 1917 the most spectacular progress in its history. And this was due to two things:—

First, because there was need of the best efforts the industry could put forth, and there were no slackers.

Second, because there was no interference or official annoyance.

It could never have been done under governmental control. Such an achievement never was recorded under governmental control. It was only a little short of miraculous.

It was accomplished because the oil industry is resourceful and always has come up to the scratch when it has been called upon. This is partly due to the fact that those who control the price of crude have always realized, with much wisdom, that the success of the industry depended upon the producer,—whether he was encouraged to drill. It has been a well known fact that activity in the oil efilds is gauged wholly by the possible profits to the operator. There has not been a time in years when the producer could not better than break even, but he has been educated to expect large profits. And this is right. He should receive large profits. But even with an exceptional marg n the fact remains that he must always be drilling, following up new pools, or he is down and out. The oil business is different than any other business in the world. There is absolutely no way of computing profits in advance, for the sufficient reason that no man knows what day the yield of a well is going to slump off 25, 50, or 75 per cent., or that it will become wholly exhausted. Of one thing there is a certainty, and that is, from the day a well is drilled in until its life is ended, its output is going to gradually decrease. This is in direct contradistinction to most businesses.

Price Record First War Year.

Now let us look at the record of prices during the first year of the war. The investigation of the oil industry by the Federal Trade Commission took place in June, 1916. The immediate cause of that inquiry was the high cost of gasoline. It developed at the hearing that 20 cents a gallon and over was paid Mid-continent refiners for gasoline in tank car lots at the refinery. There had been a shortage all over the country. The Gulf Coast district was without stocks because of a severe storm. The east was ready to pay any price that might be asked for almost any grade that might be delivered. Train loads of an inferior product of motor fuel, known as distillate, was shipped into the north middle west from California. That was after the war in Europe had been in progress upwards of two years and before this country had become involved in the conflict. Retail prices were high

all over the country, and in many cases the product was a very poor grade.

Ample Supply of Gasoline.

Since the United States entered the world war there has at all times been an ample supply of gasoline of good grade. There has been some mixing, but that was done after the stuff left the refinery. The price for standard grade of gasoline at the refinery during 1917 was never above 19 cents. Nearly all the pear it hovered around 18 cents. At the present time it ranges from 17 to 18.5 cents a gallon. Yet during the period from June, 1916, to January 1, 1918, the price of crude has gone from $1.55 a barrel down to 90 cents and back up to $2 a barrel, every independent paying a premium above the market price of from 10 cents to 90 cents a barrel. Tank cars have advanced from $675 to $3,900 each. Refinery equipment has gone up fully 100 per cent. Wages, acids, and all other expenses connected with a refinery have advanced alarmingly. Yet the price of gasoline at the refinery is lower than it was before we entered the war.

Refiners Making Smaller Profits.

The result is refiners are not making the profits they were before the war, and producers tell me they are not making as much, either. In fact, one producer told me he was compelled to shut down his wells on a $2 market because he could not break even. That sounds strong, and yet there are almost unbelievable individual instances. There are refiners who are making big profits, yet I was surprised the other day to find that in the case of one of the most prominent independents his records show that his largest earnings are from his pipe line. His refinery profits are small. By making a little on production, a margin on transportation, something on refining, and a little in marketing, he shows a pretty fair result for the year, but no more than would be expected considering his great investment. The only way the refining end of the industry has gotten away with the "game" the past year has been by virtue of a better market for kerosene and fuel oil. In a report about a year ago I predicted the day was very close at hand when the parity between gasoline and kerosene would be wiped out. That time is fast approaching. Kerosene is becoming a very scarce article. In fact, the whole physical phase of the refining problem from an economic standpoint has changed during the past year. And this kaleidoscopic character of the business is what warrents me in sayinng that the very worst thing that could happen to our security in the war would be for the government, without knowledge of the peculiarities of the business, its idiosyncracies, if you please, to take over its control and be unprepared for these changes when they come.

Fuel Oil First Today.

In 1916 gasoline was the chief petroleum product in demand. It was necessary to make immense quantities of kerosene and fuel oil, to be stored or sold at ruinous prices, in order to satisfy the demand for gasoline, because it is impossible to make gasoline or kerosene or fuel oil alone in the handling of crude. Then gasoline had to bring a price that would make up for any loss on the other products, as well as earn the profits. Today there is a surfeit of gasoline, and kerosene and fuel oil are the chief in demand. Kerosene is bringing 7c. a gallon at the refinery, and fuel oil all the way from $1.50 to $2.50 a barrel, depending upon conditions, quantity, distance to be moved, tank cars, etc. This, however, is only a temporary condition, so far as fuel oil is concerned.

When railway transportation clears up and coal can be had again the demand for fuel oil will recede and the price will decline. I venture the prediction that the time is coming when oil will be burned very little, as it is now, for fuel except by the navy. Cracking processes will make it too valuable. With kerosene it will be different. Kerosene will probably never be a drug on the market again. It is being redistilled, and 65 to 85 per cent. of it is being made into gasoline. The tendency from this time on, with possible brief exceptions, will be toward a higher price for kerosene. Already in the local markets it is selling for 15c., against 20.3c. for gasoline, the retailer making more on it than on motor fuel.

Intelligent Co-operation.

Thus the refiner has been doing his bit by intelligently conducting his business so as to make the most of it under serious conditions. Many industries have become disorganized and inefficient under these trying times. Not so with oil. The efficiency of oil has been advanced. If the railroads had held up as has the oil trade, the country would today be flooded with petroleum products. God moves in a mysterious way His wonders to perform, we are told. Possibly the railway congestion has been a blessing in disguise for the oil men of the nation. It has saved them from the depressing effects of overproduction.

Concretely, what has the independent done to help win the war the past year?

What the Independent Has Done.

He was responsible for increasing the production of crude more than 40,000,000 barrels during 1917 over 1916, in the face of great odds. It was he who did the wild-catting and took the long chances, opening up new pools and extending old ones.

He increased his refining capacity by completing about 50 new plants, or more than was ever built in a single year since Drake drilled the first oil well in 1859. And at this time he has more new plants in course of construction than was ever known before; in fact, so many that it is a serious question if he is not overdoing the thing. Personally, I believe he is and that he is going to reap the whirlwind.

He has, since the war started, made greater strides in distillation than he before dreamed possible. Today he is making just as good a grade of gasoline for motor fuel at 56 to 58 gravity as formerly he made of 60 gravity. He knows how now. Formerly he gave no heed at all to end-point; didn't understand what end-point really was. Now end-point is everything. Gravity doesn't matter so much. And with this knowledge he is making much more motor fuel and keeping business moving smoothly—to help win the war. As much depends upon the mental serenity of the people at home, almost, as upon the fighting quality in the field. The oil men are trying to run their business so that everything will be sweet at home. That's one reason they don't want to be stirred up and made ugly by useless interference while they are doing all without control—and more—than could possibly be done with control.

He has increased the capacity of old plants, built pipelines, put in cracking stills, employed efficiency men, reduced his personal expenses.

He has co-operated. There is probably no other industry which has more earnestly co-operated with all those with whom he has had to deal than the oil man. Time was when producer, refiner, jobber, independent and Standard gnashed at each other in destructive enmity. All that has disappeared since the war. Refiner and jobber, Standard and independent, are now working harmoniously for the success of our arms. What will happen after the war is another question. For the good of all it is hoped the day of agitation in oil is over. This co-operation has made is possible to supply all needs everywhere. Otherwise it would have been impossible. Boats have been loaned, products have been exchanged, tank cars have been diverted and loaned or rented, pipelines have done their shares—all to one end, and that one of patriotism. Big interests and little have vied with each other in a spirit of loyalty.

Will Take Care of Everybody.

He has said to Uncle Sam: Tell us what oil products you want and when and where you want them, and we will see that you have every drop, and on time, at fair, legitimate prices. We will take care of domestic consumers after you, but we will take care of everybody. If given half a chance, this prom se will be kept to the end of the war.

He has gone on doing his level best when all sorts of disconcerting rumors and threats of interference hace come from Washington. He has, like a soldier, stood for discipline, and been unswerved by evil rumors. That ought to count for something at Washington.

He has taken the same amount of crude and made more fuel out of it for internal combustion engines. He is paying more for investigations along this line than formerly, because more is expected of him.

He has acted quickly and decisively in face of railroad congestion by increasing his tank car equipment. When he found at the beginning of the war that the 40,000 tank cars owned (these figures include all oil tank cars) were insufficient with slower railroad movement, he went out and increased the number to 65,000. The price had increased from $675 to $3,900, but he accepted the situation and did the best thing he could. He did not complain or ask for an investigation. He did his duty like a soldier.

He has kept his prices reasonable and legitimate. He has not profiteered or taken advantage of war conditions to charge war prices. In fact, his prices have not advanced in ratio with increased cost of production.

He bowed his head and accepted the decree when the Gulf ports were closed against him, in what he believed to be a gigantic blunder, and caused congestion both in the East and the Middle West fields. He has tried to smile, and all the while he has realized that if the Gulf ports had been kept open more oil would have moved to Europe, congestion in the East would have been relieved, stocks could have been accumulated for the rush in the spring, Western refiners could have kept their plants going and had money to acquire a reserve supply.

Has Done All He Could.

In short, the oil man has done all he could to help win the war. He has been good. Should the good be punished? Then why any governmental control? Is it to become the fashion to inflict punishment before the crime is committed? Is there no virtue in times of war in being industrially good? If not, then why be good? Why not get yours while the getting is possible?

If the government will say frankly to the oil industry that, so long as it conducts itself properly and keeps the supply up to the demand it will not be molested; and then if it will say frankly that certain quantities of petroleum products will be needed at certain times in certain places, I feel sure I can speak for the industry and say every demand will be faithfully met. Unless politics are involved, what more can be asked? For illustration: It is known that we are going to conduct a vigorous air campaign, probably this year. A special aircraft fuel is going to be needed. Why not set forth the specifications now and apportion the needs to the different sections of the country and have the supply where it is needed when it is needed, and not wait until success is threatened because there is no light-grade fuel for airplanes? The industry is anxiously awaiting information. If after a while there is a shortage, it should not be charged up against the industry.

In short, if the government will co-operate with the oil industry and not interfere with the natural operation of the business, every drop of oil needed will be promptly supplied when and where needed and at proper prices.

Just What Constitutes a Good Lubricating Grease; With a Few Words as to Others.

M. M. SANDERSON,
President-Chemist, Warren Lubricant Company, Buffalo, N. Y.

THE grease business has grown to such vast proportions that it has become one of the indispensable industries of the age.

Lubrication of your machinery is just as imperative and just as vital to the life of the bearings as good victuals are to the life of your being. Lubrication is a greasing condition and not a line of conversation. Exhaustive tests and economic research have established the fact that lubrication, by the use of good lubricating grease, is vastly superior to that of oil, which wastes and drips, leaving the bearings dry.

To illustrate:—Locomotive rod lubrication is a most peculiar condition. It has been impossible to meet this requirement with anything but grease. A railroad engineer many years in service remarked to the writer that it would be utterly impossible to make long endurance runs with anything but a locomotive rod grease.

There are, however, certain classes of light rapid running machinery that can be lubricated more conveniently by the use of oils when applied with circulating feed and self-oiling bearings, but where the squirt can must be resorted to it is an expensive and wasteful application, and an oath-producing process, with inevitable hot bearings. We know of a loose pulley in a large oil refinery that cannot be run cool with anything but good grease; hence, the necessity of the grease expert.

Railroad Lubrication.

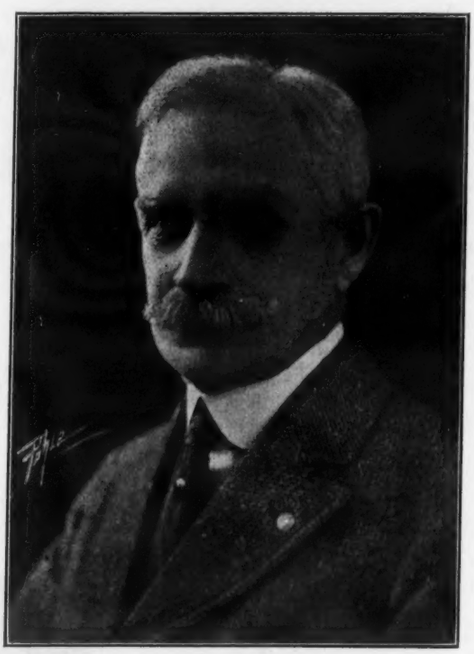
We have all ridden on railroads and have wondered why the train kept stopping every few miles, and have listened to the wag's inquiry, "Hasn't that cow gotten off the track yet?" the real cause being "a hot box," the journal having been lubricated with an oil which lacked a perfect lubricating film, or had leaked away, causing the brasses to cut, "the only alternative being a blaze." A bearing which becomes heated where oil is used must be cooled by artificial means, usually with water, the only requisite quickly obtainable, and a hot bearing so cooled, a repetition is necessary every few miles or minutes until the brasses can be changed. Gentlemen, if that bearing had been lubricated with a good lubricating grease, which always carries a good lubricating film, and imparts perfect lubrication, the bearing could have become hot even unto a blaze, but the grease would have broken down of itself with the increased heat, immediately supplying the necessary lubricating agency that would have prevented the brasses from cutting. Good grease never drips or wastes away—it is always on the job, and the cars can be kept rolling on schedule time.

During the World's Fair period at Chicago our factory was located at Grand Crossing. "The Diamond Special," the pride of the Illinois Central, pulled in with a blazing hot box on the engine, which had developed in the eight-mile run from Chicago. At the request of the station agent's urgent 'phone call, the writer rushed over with a bucket of grease—of course, good grease—and packed the blazing box and told the engineer that he could make Kankakee, a distance of forty-six miles, and he wired back:—"Bearing cool; can hold my hand on it." The next day brought us an order from the purchasing department for a supply.

It has developed that a train lubricated with grease has shown a slight increased co-efficient of friction at the start, but after a long endurance run it developed a less co-efficient refriction in a competitive test with oil, besides showing a great saving in cost.

What Is Grease?

We see a lot of discussion these days by self-styled grease experts about "What Is Grease and How It Is Made," and to draw our deductions from the products they produce, a grease maker with a practical working knowledge is forced to say:—"Gentlemen, grease is anything, from guts to glue"—pardon the expression. They tell us now that they will show us the value of grease by photography. Please allow me to say that you can no more determine



M. M. SANDERSON
Warren Lubricant Company, Buffalo, N. Y.

the true value of lubricating grease by photography than you can dope out the virtue of the beautiful woman by her photograph.

A laboratory test with enduring research will tell you one thing, but a practical test in service is the only one that will reveal true economic lubricating value.

I have discovered during my thirty-nine years of experience as demonstrator in many tests on railroads, electric lines, steamships, flour, steel and textile mills, saw-mills, etc., on the selling end of the business and in connection with practical grease making on the other, that I have been able to tell more about grease making than I have been able to gather from the other fellow. It took me six months to find out when to add the water and how much—all of us are not brilliant, you see. To illustrate further, recently a gentleman called at our office with a letter of introduction from one of our best customers, requesting courtesies, etc. The gentleman was chemist of one of the large railroads, if I should mention his name you would al know him. . . . "You, of course, wish to see our plant." "With pleasure, certainly." A diplomat always prepares an avenue of escape, remarking to him that there were portions of our plant that we would not show our mother-in-law. Returning to the office I requested the chemist to be seated, remarking that he was a good chemist, otherwise he would not be holding the position he was. "Now if you will kindly be seated, we will get down to brass tacks. You may put your finished college education in chemistry against my knowledge acquired in a university of hard knocks and bumps, and in a laboratory of labor and research, and we will see where we land." We both sparred for an opening—finally I said, "Let me tell you something, your theory will tell you that a given quantity of fat or saponified matter can be saponified with a certain quantity of caustic or lime solution, bct, my dear fellow, there is a certain distance between these two component parts that only a practical working knowledge can determine just how much of each must be used, and just how far it must be cooked to produce a perfectly homogeneous lubricating grease devoid of unsaponified saponifiable matter free from little devils, known to the practical grease maker as 'unfinished emulsion and unfinished grease,' which causes so many hot bearings and imperfect lubrication." The chemist replied, "That is just what I came here to find out."

There Are Formulas—and Formulas.

To come more directly to grease making, there are formulas, then there are working formulas that can only be worked with a practical working knowledge. I could publish one of my formulas and it would be Greek to the novice—it cannot be told, it must be seen in operation for a man to attain the necessary knowledge to make a good lubricating grease. To sidestep a moment:—There is only one way to make bread. You may give Pillsbury's best or Gold Medal flour to six of the most expert bakers and no two of them will produce exactly the same bread, the same thing applies to grease making, no two grease makers will produce the same kind of grease from the same kind of ingredients, nor will any one grease maker produce the same kind of grease in two plants situated great distances apart. Raw materials will change with distance. While the grease may lubricate as well, it will be different in appearance. There is only one way to make cup grease or lubricants, and that is to use good horse grease or tallow, and 25-degree and 23-degree gravity paraffine oil. If you use a lighter oil you will lose out. A grease composed of a combination of cottonseed oils, vegetable fatty acids, cheap animal matter and neutral oil will produce a "chop suey" instead of a cup grease. It will not only fail to lubricate but will corrode the bearings. If your customer should desire a barrel of good lubricating oil, the last thing you would think of would be vegetable oil—why use it in grease?

No Substitutes.

The grease maker who uses anything as a substitute is not well informed and produces a greatly inferior lubricant. Horse grease and paraffine will produce a translucent lubricant, while tallow and paraffine oil will produce an opaque compound. A solution of calcium hydrate will produce a smooth grease, while a solution of caustic soda will produce a fibrous or sponge grease. "You pay your money and take your choice."

Recently we have received many samples of so-called "grease oil," one in particular from a prominent refiner with an accredited 30/35 viscosity. We informed the gentleman that it would be unfit to lubricate a good line of wheelbarrows with. Why there would not be enough greasy substance in a tank car of that stuff to decently lubricate a humming bird's eyelid.

Equipment.

Equipment is one of the essential requirements. We threw out the kind of machinery twenty years ago that is today being used by some of America's greatest grease makers. Years of experience has enabled us to personally create greatly improved machinery electrically driven, with variable speed, direct connected motors, operated with good old power from Niagara Falls.

Allow me to say in conclusion that the man who cooks his emulsion in one tank, drops it into another to add his paraffine oil, and then mills it to eliminate the little devils, referred to above, or to make different densities, does not know how to make good lubricating grease. Remember—any old thing that will saponify will make soap, but will not make a good lubricating grease, and the man who substitutes vegetable oils together with other cheap ingredients, fillers, etc., deceives himself and cheats his customers. There is a daily increasing demand for a good lubricating grease, occasioned chiefly by expert automobile lubrication.

THE PRODUCTION OF CASINGHEAD GASOLINE AND POSSIBLE SAVINGS TO BE EFFECTED IN GASOLINE PRODUCTION COST.

By GUSTAV EGLOFF.

IN a scant thirteen years the gallonage of casinghead gasoline has increased in per cent. 2,605,220. In the last six years the per cent. increase has been 1,300, and from 1915 to 1916 it has shown an increase of 59 per cent. In dollars and cents the casinghead industry in thirteen years has shown a 3,602,000 per cent. increase, and for the years 1915 and 1916 a percentage increase of 104. The above figures indicate the staggering progress of the casinghead gasoline industry, an infant in the petroleum industry, which augurs well for a continued growth in the future.

The casinghead gasoline industry dates practically from the year 1904, when 4,000 gallons of gasoline were made by passing natural gas through pumps and water condensers. This 4,000 gallons sold for the sum of $400. Since 1904 the industry has made giant strides, so that the year 1916 showed a production of 104,212,809 gallons, valued at $14,408,201.

Production and Prices.

In table 1 and 2 is shown the growth of the casinghead gasoline industry over a series of years and data for the year 1916 in detail. The value per gallon of casinghead gasoline has increased practically 100 per cent. from 1914 to 1916. In the years 1914 and 1915 the Cushing field in Oklahoma was producing enormous quantities of high percentage gasoline crude petroleum, and the price of crude found a low leve of 40 cents a barrel from February 15 to April 2, 1915; whereas the crude in this field is now selling at $2 a barrel, plus, in many cases, a premium per barrel. Pennsylvania crude reached a low level of $1.35 a barrel from April 3 to August 14, 1915, while at the present time a barrel of Pennsylvania crude is quoted at $3.75. The stagnant petroleum market of 1914 to 1915 accounts for the low price per gallon of casinghead gasoline of 7.3 cents for 1914 and 8 cents for 1915. The petroleum market recovered in the latter part of 1915 with marked increase in the value of petroleum products, so that gasoline extracted from natural gas in 1916 sold for an average price of 14 cents. The statistics for the year 1917 will probably show an average price around 20 cents per gallon, with a possibility of reaching 25 cents per gallon as an average for the year 1918.

It is highly significant to note the increase in the amount of natural gas treated in the years 1915 and 1916 and the average gallonage of gasoline per 1,000 cubic feet of gas. In 1915 24,000,000,000 cubic feet of gas was treated, with an average of 2.57 gallons of gasoline per 1,000 cubic feet of gas handled; while 208,000,000,000 cubic feet of natural gas, with an average of 0.499 gallons gasoline per 1,000 cubic feet of gas, was treated in 1916. This greatly increased amount of gas treated and the extraction of only one-fifth as much gasoline as an average per 1,000 cubic feet indicates the greatly increased use of the absorption process of gasoline hydrocarbon extraction. It is clearly shown that in 1916 the State of West Virgina Pennsylvania, Ohio, Kentucky and Kansas extracted over 30 per cent. of the total gasoline produced from natural gas, with an average of less than two pints of gasoline per 1,000 cubic feet of gas profitably. The State of California produced 17 per cent. of the total natural gas gasoline in the year 1916, with an average yield of less than six pints per 1,000 cubic feet of gas treated.

600,000,000 Gallons of Motor Fuel.

The following is predicated on the grounds of normal increase extrapolated from past values. The minimum amount of gasoline from natural gas "wet" and "dry" by the compression, absorption and refrigeration processes or combinations of all three, for the year 1918, which can be expected will be 200,000,000 gallons. By blending with suitable naphthas this amount of high-grade gasoline will add 600,000,000 gallons of motor fuel to our resources.

Methods of Production.

Processes in use for the recovery of gasoline either from casinghead or natural gas involve mainly the compression or absorption system with a few plants using refrigeration or a combination of all three.

The compression method of producing gasoline from either casinghead or natural gas involves the use of either one or multiple stage compressors utilizing pressures from 20 to 350 pounds, dependent upon the "dryness" or "wetness" of the gas treated. A typical operation of a compression plant for the extraction of gasoline would be by passing a casinghead gas through a low pressure cylinder at 50 pounds and then low pressure cooling coil treatment. This gives a 70 to 80 degree Baume gravity gasholine. The uncondensed gas from this treatment then passes through a high pressure cylinder at 250 pounds and further passing through high pressure cooling coils, giving a gravity gasoline of 80 to 90 degrees Baume. The uncondensable gases from the above treatment then are carried into an expansion cooling coil under 250 pounds pressure which gives a Baume gravity gasoline of from 90 to 100 degrees Baume and sometimes higher. The percentage production resulting from the above method tabulates as follows in table 3:

Table No. 3.

	Baume gravity.	Percent. of total gallons gasoline compressed.
Low cylinder pressure. 50 lbs..	70— 80 deg.	20 to 22
High cylinder pressure. 250 lbs..	80— 90 deg.	58 to 60
Expan. cooling coils. Under 250 lbs....	90—100 deg.	22 to 18

The compression method of gasoline extraction from gas does not handle profitably a gas which contains much below one gallon of gasoline per 1,000 cubic feet of gas treated. Casinghead and natural gas contain between zero to as high in some cases as thirteen gallons gasoline per 1,000 cubic feet of gas.

Refrigeration Method.

The refrigeration process in commercial use to a very limited extent is the ordinary ammonia cooling system. A number of condensing coils are used with temperature gradients to as low as 10°C. The Baume gravity of the condensate ranges from 60 to 95 degrees. A mixture of the condensates gives an average of 80 degrees Baume. This type of refrigeration is not in general use due to its high cost of maintenance, particularly at the present time. The simplest refrigeration system is by use of expanding the hydrocarbons in the compression system of gasoline extraction.

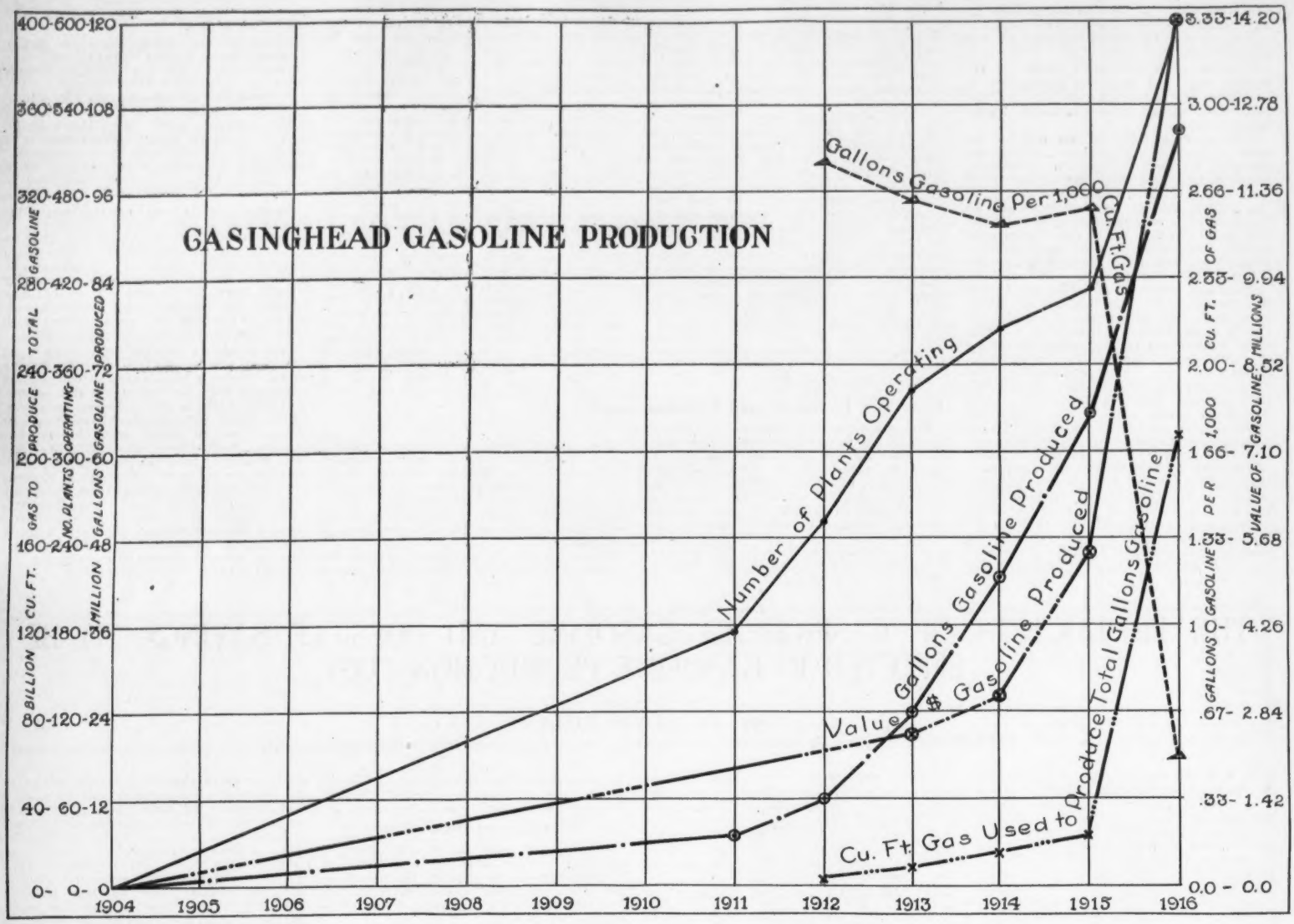
Absorption System.

The absorption process is based upon the principle of the solubility of hydrocarbons in a suitable oil as mineral seal, straw, or creosote and similar oils. The main process in operation which is protected by patent rights stipulates the absorption of gasoline hydrocarbons under pressures higher than 30 pounds. This method of operation consists in passing the gas through a suitable oil under pressure, through towers filled with hollow tile or other material to prevent channeling of the gas through the absorbing liquid. In the larger plants which handle 80,000,000 or more cubic feet per day a whole battery of scrubbing towers are arranged with heat exchangers from the hot oil of the steam still and cold oil of the towers. A high degree of technical and engineering skill has been expended and used to economize in every step of the absorption process. The gasoline extracted by the absorption method is highly profitable when as low as one pint is present for every 1,000 cubic feet

GUSTAV EGLOFF.
Consulting Chemical Engineer and Expert on Petroleum Processes.

Gustav Egloff was born in New York city. His academic work was taken at Cornell University where he received the degree of A. B. Four years of graduate work were taken at Columbia University where he held the Barnard Research Fellowship in Chemistry. While there, the degrees of M. A. and Ph. D. were conferred upon him. He was on the chemical faculty of Columbia University, also acting for a time as assistant curator of the Candler Chemical Museum. He was experimental hydrocarbon chemist to the Bureau of Mines for a time. The Aetna Explosives Company employed him for a time as chief experimental hydrocarbon chemist. He is now a consulting chemical engineer and chemist.

He has published numerous articles in the scientific and technical journals upon hydrocarbons and their reactions and also upon physical chemistry. He has invented a number of processes in petroleum technology. Mr. Egloff is a member of the following societies:—The American Chemical Society; the Society of Chemical Industry; the Chemist Club of New York; Xigma Xi; Phi Lambda Upsilon; Association for the Advanceme nt of Science.



of gas treated. In the more highly developed plants where the gas to be treated warrants, a combination of compression, refrigeration and absorption system is in use, which leaves a bone dry gas to be utilized as a fuel, with all the gasoline hydrobarbons extracted from the starting gas.

Natural Gas.

The amount of natural gas produced in 1916 in round numbers was 753,000,000,000 cubic feet sold and used. In 1917 approximately 900,000,000,000 cubic feet of natural gas was used, and for the year 1918, at least 1,000,000,000,000 cubic feet of natural gas will be consumed. The question arises as to how much gasoline could be extracted in the year 1918 from this amount of gas. It is a reasonable assumption to make that for every 1,000 cubic feet of natural gas passing through an absorption system there would be produced on an average at least one pint of gasoline hydrocarbons. Now it is well known that only a small per cent. of our natural gas is treated so as to extract gasoline hydrocarbons before reaching the ultimate consumer. It would be true economy to scrub every cubic foot of natural gas which would show a profitable yield of gasoline. This is not being done at the present time. Hence, by treating one thousand billion cubic feet of natural gas we could produce 125,000,000 gallons of gasoline of a high volatility and gravity which would lend itself to blending with low gravity naphtha and add greatly to our store of gasoline motor fuel. This amount of gasoline blended with naphtha would add 375,000,000 gallons of motor fuel to our supply.

Casinghead and Natural Gas.

The distinction between casinghead and natural gas, as to their hydrocarbon content, is purely an arbitrary one. They both contain the same series of paraffin hydrocarbons ranging from methane, a gas, to heptane, a liquid, at ordinary temperatures and pressures

The gas which passes between the casing of the well and the pipe through which the oil flows from the well is called casinghead gas. The volume of gas which passes between the casing and the oil pipe is usually small in a 24-hour day, amounting to several thousand cubic feet only; but there are some wells in the Oklahoma fields which flow several hundred thousand cubic feet of casinghead gas. In many wells where the casing or well head is shut in, a pressure of 20 to 90 pounds may accumulate. It is well known that the oldest wells invariably show a high yield of gasoline per 1,000 cubic feet of gas; this is due to putting old oil wells under a vacuum, thereby increasing the yields of extractable hydrocarbons in the casinghead gas. The placing of a vacuum upon a well is analogous to ordinary distillation in vacuo, viewing the oil well area as a still at the temperature of the sands and dome. It sums itself up into distillation at low temperature and vacuo. The extractable hydrocarbons from the casinghead gas are of low boiling points and low specific gravity hydrocarbons as the following table No. 4 shows:—

The term natural gas covers both; gas which is not in contact with appreciable quantities of petroleum oils, and casinghead gas which is always in contact with petroleum. A "dry" natural gas is composed of methane, ethane, propane and no more than a small per cent. of butane; whereas, a "wet gas" emanating from a gas free from contact with petroleum, or in contact with petroleum, will show paraffin hydrocarbons as high as heptane in the series.

A fractionation analyses of a "dry" and "wet" natural gas by Dr. G. A. Burrel is illuminating, in table No. 5 and table No. 6.

Table No. 1.—Casinghead Gasoline Production.

Year.	No. of plants operating.	Gallons of gasoline produced.	Per cent. gasoline gained over previous year.	Cubic feet gas used to produce total gallons gasoline.	Average price cents per gallon gasoline.	Value of gasoline in dollars.	Gallons gasoline per 1,000 cubic feet gas.
1904	1	4,000	..	.....	10.0	400	....
1911	176	7,425,839	..	.....	...	.....	....
1912	250	12,081,179	63	4,687,796,326	...	.....	2.760
1913	340	24,060,817	100	9,899,441,500	10.0	2,458,443	2.430
1914	386	42,652,000	77	16,894,557,000	7.3	3,105,909	2.510
1915	414	65,364,665	53	24,000,000,000	8.0	5,500,000	2.570
1916	594	104,212,800	59	208,800,000,000	14.0	14,408,201	0.499

The data in Table 1 is shown clearly in the graphical representation of same.

Table No. 2.—Gasoline Extracted from Natural Gas and Sold in 1916.

State.	Number of plants.	Gallons gasoline produced.	Value.	Average recovery of gasoline per 1,000 cubic feet in gallons.
Oklahoma	116	49,079,722	$5,942,198	1.968
West Virginia	147	18,765,056	3,625,298	0.179
California	26	17,158,754	2,293,822	0.691
Pennsylvania	195	9,714,926	1,126,173	0.252
Ohio	53	2,638,571	470,804	0.485
Illinois	32	2,260,288	262,664	1.688
Louisiana	7	2,113,159	269,564	2.329
Texas	4	1,292,811	201,023	1.363
Kentucky	5	725,467	141,347	0.129
Kansas	3	215,000	35,030	0.132
Colorado	6	249,055	40,283	2.422
Totals	594	104,212,809	14,408,201	0.499

Table No. 4.

Hydrocarbon.	Formula.	Boiling point, degrees Cent.	Boiling point degrees Fahr.	Specific gravity (at 0° C. and 760 mm.; air = 1).	Liquefaction point. Degrees Cent.	Liquefaction point. Lbs. sq. in.
Methane	CH_4	—160.0	—256.5	0.554	—95.5	735
					—81.8	807
Ethane	C_2H_6	—93.0	—135.4	1.049	—35.0	664
Propane	C_3H_8	—45.0	—49.0	1.520	97.0	647
Butane	C_4H_{10}	1.0	33.8	2.004	1.0	15
Pentane	C_5H_{12}	36.4	100.4	....	....	...
Hexane	C_6H_{14}	68.9	158.0	....	....	...
Heptane	C_7H_{16}	98.4	208.4	....	....	...

Table No. 5.—Results of Distillation Tests of Gasoline by Absorption with "Mineral Seal Oil."

Specific gravity, 77.4° B.

Distillation temperature. Deg. F.	Volume of distillate. Per cent.	Specific gravity of distillate. Deg. B.
80 to 102	10	
102 to 124	20	88
124 to 138	30	
138 to 152	40	
152 to 168	50	78
168 to 182	60	
182 to 202	70	72
202 to 232	80	68
232 to 250	88	65
Loss	12	..

Table No. 6.—Results of Distillation Tests of Gasoline by Absorption with "Mineral Seal Oil."

Specific gravity, 80° B.

Distillation temperature. Deg. F.	Volume of distillate. Per cent.	Specific gravity of distillate. Deg. B.
80 to 110	10	91.8
110 to 124	20	89.0
124 to 136	30	86.7
136 to 146	40	83.4
146 to 158	50	80.4
158 to 172	60	77.4
172 to 188	70	73.3
188 to 208	80	70.2
208 to 244	90	65.0
244 to 290	93	63.1
Loss	7	...

In the ordinary distillation of petroleum crude oil the products of distillation pass through water cooled condensers. In the first distillation either gasoline or benzine is the first cut, and upon further rerunning in steam stills each cut gives off gases which are uncondensable and they are commonly termed "tail house gases." The amount of gas given off and uncondensed during distillation is unknown, but by indirection we may arrive at figures which may be of some value in indicating the size of the losses. In the year 1917 of the 286,378,000 barrels of crude petroleum distilled, 10,400,000 barrels were lost during the distillation and refining of marketable products, or a loss of 3.6 per cent. of the total amount refined during the year 1917. Twenty per cent., or 57,750,000 barrels of the total barrelage of petroleum crude oil refined in 1917, was marketable gasoline or motor fuel. In round numbers every barrel of gasoline would occupy in the vapor condition 1,500 cubic feet at standard conditions, or 86,625,000,000 cubic feet of gas by vaporizing 57,750,000 barrels of gasoline. Recovering by analogy from casinghead gas, which yields above one gallon gasoline per 1,000 cubic feet of gas as an average by either the compression or absorption extraction methods, it would be reasonably safe to state that for every 42 gallons of gasoline condensed during distillation of the crude one gallon gasoline in the form of tail house gases and equivalent in volatility and Baume gravity to casinghead gasoline is lost. This amounts to 3.4 per cent. of the gasoline marketed in 1917, or 86,625,000 gallons of gasoline resulting from treatment of tail house gases in distillaton of petroleum crude oil or on the basis of total crude refined the above figures calculate 0.7 per cent., or 2,062,500 barrels lost, due to non-condensation of the tail house gases, and, since the total average percentage loss due to refining 286,378,000 barrels of crude was 3.6 per cent. hence, 20 per cent., or one-fifth of this, was due to the uncondensable or tail house gases in the distil-

lation of crude petroleum. In some progressive refineries they have put in methods for extracting gasoline hydrocarbons from tail house gases, and it is to be recommended wherever the barrels of crude run a day is large enough to put in an extraction system so that condensable hydrocarbons in tail house gases may be recovered.

The above amount of gasoline which corresponds to casinghead gasoline could readily be blended with naphtha and would ad to our motor fuel supply to the extent of 260,000,000 gallons.

The evaporation or "weathering" losses of casinghead gasoline are great. The practice in the earlier development of the industry has been to "weather" the "wild" gasoline to a gravity which would allow of shipment. The evaporation losses in many plants are as high as 50 to 75 per cent. before the gasoline could pass the "Department of Safe Transportation of Explosives" test. A few typical evaporation tests are tabulated in table No. 7:—

Table No. 7.—Evaporation Losses of Natural Gas Gasoline When Allowed to Stand Exposed to the Air.

	B. gravity 95 degrees.	B. gravity 96 degrees.
Percentage loss over 24 hours	53.0	50.0

Blending casinghead gasoline with naphtha not alone cuts down the evaporation losses, but utilizes a petroleum product without the pale of general gasoline specifications. Table No. 8 indicates the evaporation losses of several blends of naphtha and casinghead gasoline. Comparing with table No. 7, the much lower evaporation losses of the blends is clearly shown.

Table No. 8.—Evaporation Losses of Gasoline and Gasoline Naphtha Mixture.

	Naph. 54° B.	Gas. 90° B.	10% gas. 90% naph. 58.5° B.	25% 75% 63° B.	50% 50% 70° B.
Percentage loss over 24 hours	1.8	14.8	2.2	3.3	6.2

Dependent upon the gravity and volatility of blending naphtha used, one can blend satisfactorily naphtha as low as 45 degrees Baume and as high as 55 degrees Baume, and to some extent straight kerosene, since the volatility of a motor fuel is the principal criteria upon which to base the value of a motor fuel.

The Hisgen bill submitted to Congress, asking for a gravity of at least 63 degrees gravity gasoline, as so forcibly brought out by Dr. Robert J. Moore of Columbia University, in the Oil, Drug and Paint Reporter of January 21, 1918, is not a test at all of the suitability of a motor fuel. A straight gravity test of at least 63 degrees Baume as to the value of a motor fuel would cut down our motor fuel supply enormously, and should the bill be passed, it would work a tremendous economic loss to the United States. The bill has been undoubtedly drawn up by men who are totally unfamiliar with the petroleum industry as relating to gasoline and would indicate an armchair knowledge of what is and what is not a suitable motor fuel. In short, the bill is unwise, foolish, vicious and not based upon sound economics.

Summary.

The casinghead gasoline industry in 1916 has added with blending to our supply at least 250,000,000 gallons of motor fuel. This is approximately 10 per cent. of the total gasoline sold and distributed in the United States in the year 1916.

The gallonage added to our motor fuel supply due to blended casinghead gasoline was, in round numbers, 400,000,000 gallons, which represents something like 12 per cent. of the total motor fuel marketed in 1917.

The year 1918 should show something like 600,000,000 gallons of motor fuel added to our supply, due to blended casinghead gasoline, or 20 per cent. of the total marketed motor fuel.

By the extraction of gasoline hydrocarbons from 1,000,000,000,000 cubic feet of natural gas which will be produced in 1918, there would be aded to our supply of motor fuel 375,000,000 gallons.

By the extraction of the gasoline hydrocarbons uncondensed in tail-house gases, resulting from the distillation of crude petroleum oil, there would be added to our motor fuel supply in the year 1918 260,000,000 gallons.

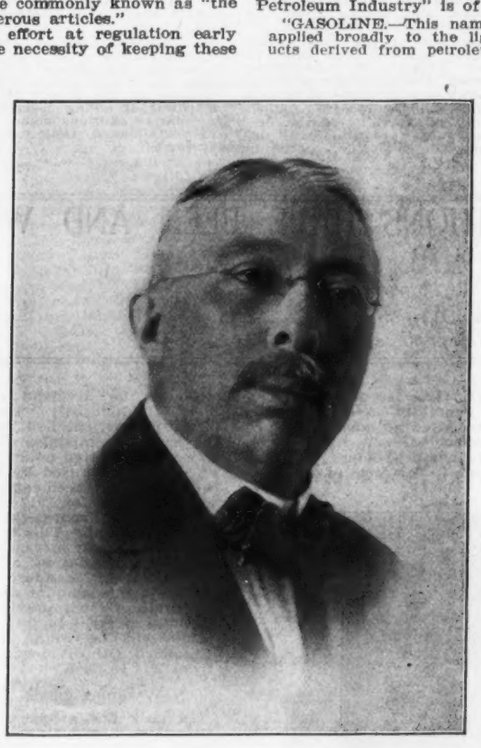
The casinghead gasoline industry is one of the most important branches of the petroleum industry. It adds tremendously to our motor fuel supply. The addition of 400,000,000 gallons of motor fuel to the 1917 supply has added to our economic wealth millions of dollars. The casinghead industry has kept the price of gasoline within reason, for without this, a scant thirteen-year-old industry, it is certain the price of motor fuel would be 50 cents a gallon to the consumer at the present time. Hence, the casinghead and natural gas, which previous to 1904 went to waste, has now become in the year 1918 not alone of decided economic wealth in our national life, but also of great importance in the safeguarding of our national life in the world struggle in which we are now engaged.

THE NECESSITY FOR A STANDARD IN EXPLOSIVE PETROLEUM PRODUCTS—GASOLINE AND NAPHTHAS—AS A PROTECTION TO SHIPPERS AND CONSUMERS.

By W. S. TOPPING,
Assistant Chief Inspector, Bureau of Explosives.

THE first organized effort to regulate the transportation of explosives was made by the American Railway Association in 1905, and at that time, with the exception of one individual line, no attempt had previously been made to regulate in any particular way, the packing, marking or handling of what are commonly known as "the other dangerous articles."

The first effort at regulation early revealed the necessity of keeping these



W. S. TOPPING
Assistant Chief, Bureau of Explosives.

her dangerous articles away from explosives, primarily for the purpose of preventing fires which might cause explosions, and also to prevent fires and losses incident to the handling in transportation of the other dangerous articles themselves. This situation led to the adoption of regulations covering the transportation of inflammable articles and acids, and in the preparation of this first set of rules (1907-1908) the Bureau of Explosives utilized the available information and experience of the subject and gave full consideration to the general customs of the trade in this and in other countries. At that time it was a generally accepted fact that the principal products of petroleum which were to be considered as dangerous from a transportation standpoint were benzine, gasoline and naphtha, and the first rules included these articles as requiring special care and attention.

In the distillation of petroleum crude oil, the oil is distilled in a fire-heated still and the first condensate has been commonly called benzine. This benzine upon redistillation in a steam still gives off a lighter product which has been commonly known as gasoline, and a heavier product commonly called naphtha. The following quotation from Bacon & Hamor's "American Petroleum Industry" is of interest:—

"GASOLINE.—This name has been applied broadly to the lighter products derived from petroleum ranging in gravity from 50° Be. to the high gravity products 90° Be. and over, which are extracts from the still gases by compression.

There is some confusion in the use of the names benzine, gasoline and naphtha, but the best practice is to employ the term gasoline for any mixture of light hydrocarbons intended for use in any kind of a vaporizer, i. e., to be gasified in a gas machine, gasoline torch, gasoline stove, or automobile carburetor.

NAPHTHA.—This term which was formerly applied to any fluid and volatile variety of bitumen is now generally held to all those petroleum fractions which boil below 280° F., but this limit is not observed by all refiners, and consequently commercial naphtha may present wide variations. In the valuation of naphtha, stress is laid on a mild odor, and a water white color.

The term naphtha is also applied to the less volatile portion obtained by redistilling benzine and boiling from 95-120°C. This term is unfortunately very loosely used, and is synonymous with "mineral naphtha." The best practice is to confine the designation naphtha to mixtures of light hydrocarbons intended for some purpose that requires a very good odor, such as dry cleaning, varnish-making, soap making, etc."

What "Naphtha" Includes.

In a comparatively recent case before the Interstate Commerce Commission, by stipulation it was agreed between the parties interested that "the term 'Naphtha' is a generic term commonly referring to petroleum distillates which are heavier than gasoline and lighter than kerosene. That for the purposes of comparison the generic term may be said to include (1) refined naphtha, (2) crude naphtha, (3) heavy naphtha. That the chemical and physical properties of a heavy naphtha as compared with refined naphtha and crude naphtha are shown by the following table:—

	Refined naphtha.	Crude naphtha.	Heavy naphtha.
Source.	Crude petroleum	Crude petroleum.	Crude petroleum
Process	Distillation and purification.	Distillation.	Distillate from residuum from gas oil used in carburetting illuminating gas. Gas oil is a product of crude petroleum
Specific gravity.	C. 771-C. 747.	0.771.-747.	0.900.
Flash point.	15-70° F.	15-70° F.	90-94° F.
Boiling point.	125-180° C.	125-180° C.	145-180° C.
Color.	Water white.	White to straw yellow.	Straw yellow clear.
Use.	Solvent.	Solvent.	Solvent.
Chemical composition.	Hydrocarbons of paraffine series.	Hydrocarbons of paraffine series.	Hydrocarbons of both paraffine and benzine series.

Handling Dangerous Articles.

In the enforcement of the regulations covering the safe handling of dangerous articles, it has been the custom of the bureau, through its corps of inspectors, to first educate railway employes and shippers in the requirements of rules prescribed for their safety. Railroad men have been taught to regard as most dangerous those inflammable liquids of known characteristics and which have low flash points. It must be admitted that the hazards connected with the handling of any inflammable liquid under the ordinary conditions incident to transportation are greater when the flash point is low than when the flash point is comparatively high. For these reasons the definition of an inflammable liquid as prescribed by the regulations of the Interstate Commerce Commission define an inflammable liquid as one that has a flash point at or below 80° F.

Need for Exact Terms.

Comparatively recent developments in the transportation of inflammable products have indicated the necessity of avoiding misleading descriptive terms. From the beginning of regulation, an article described as naphtha has been generally understood to mean a liquid with flash point below 80° F., and yet in certain parts of the country shippers have been forwarding liquids described as naphtha with flash points as high as 110° F. This condition is bound to create confusion in the minds of railway employes who have been taught to regard as dangerous a liquid described either as benzine, gasoline or naphtha and have been taught that such a liquid requires attention in its handling that is not necessary for the treatment of illuminating oils. A still further complication has arisen because of the practice of certain shippers in describing a product consisting of casinghead gasoline and naphtha, mixed mechanically as "Unrefined Naphtha." The unfortunate experience of the railways and of some consumers since the development of the casinghead gasoline industry have resulted in widespread information and fear of the hazardous properties of casinghead gasoline. The material is not always shipped unmixed or unblended with other products, and according to its origin or treatment before shipping possesses varied degrees of hazard.

Casinghead Dangers.

The mechanical mixture may be more hazardous from a transportation standpoint than is a properly weathered and steamed straight casinghead gasoline. Whether wrongly or not, railway employes generally believe that a tank car containing casinghead gasoline is to be treated with greater respect and care than is a car containing a material described as naphtha or as unrefined naphtha. This state of mind may be due to the common knowledge of railroad employes as to the properties and uses of naphtha, and to the special knowledge obtained since 1910 as to the dangerous characteristics of casinghead gasoline.

The present regulations treat as an inflammable liquid one that has a flash point at or below 80° F. and in the list of well known dangerous articles, benzine, gasoline and naphtha are shown as having flash points at 0° or below. It is confusing to the ordinary railroad agent and to the ordinary shipper or consumer for a shipment described as naphtha to be accompanied by a shipping order with the notation thereon, "No Placards Required." Under the regulations this notation means, when properly used, that the article described thereon is non-inflammable under the regulations, i. e., has a flash point higher than 80° F. and therefore does not require the protection of inflammable placards.

Possible Change in Regulations.

If the requirements of the trade still make it necessary that naphtha shall mean a distillate of varying flash and boiling points, this confusion could be overcome by a change in the regulations, prefixing an asterisk (*) to the word "Naphtha" as shown in the list of well known dangerous articles, which would mean that for any shipment described as naphtha it would be necessary for the shipper to certify on his shipping order and bill of lading, and indicate whether or not placards were aplied or were not re-

quired. It might take some months of educational work to teach the railway employes throughout the country that naphtha was not in every instance an inflammable liquid with a very low flash point; it could be done, however. Our interest in this matter is primarily to prevent misuse of the term "Naphtha," either with or without the word "Unrefined," when it is erroneously applied to a mechanical mixture consisting in part of so dangerous a liquid as casinghead gasoline.

No Agreed-Upon Standard.

Irrespective of the necessities from a transportation standpoint, it is known that the refiners, jobbers and users of naphtha have been unable to agree upon a standard as to the limits applying to this article of commerce. It must be admitted in the event of there being an agreement and fixation of a standard by a properly constituted legal authority, that the transportation interests could accommodate themselves to the situation.

Under the regulations a tank car which contains a casinghead gasoline, either blended or unblended, must be protected by a special dome placard reading as follows:—

CAUTION

Avoid Accidents.

DO NOT REMOVE THIS DOME COVER WHILE GAS PRESSURE EXISTS IN TANK.

Keep lighted lanterns away.

The object of this placard is to give notice to railway employes and employes of consumers, that the contents of the car may be under internal pressure and that this pressure must be released before an attempt is made to remove the dome cover. It is unfortunate that notwithstanding the presence of this special placard on tank cars containing this mixture, railway employes and others have disregarded its caution and have folishly attempted to remove the dome cover without releasing internal pressure, and serious fires and loss of life have resulted. In two particular instances the excuse was given that because of the description on the billing, viz.: "Unrefined Naphtha," the employes in question thought that the contents of the car did not consist of casinghead gasoline or anything more dangerous than what is commonly known as naphtha, and in this aspect of the matter will be seen the difficulty of correcting impressions formed through general knowledge. The benefits of proper regulations are secured only by education, instruction and continued supervision. The necessity of new instructions as made requisite by the use of chemical names for new products possessing greater hazards nullifies the benefits gained by months or years of previous education and experience.

Protection for Tank Cars.

It may be a wise provision to require that all tank cars containing any inflammable liquid with a flash point below 20 deg. F., or even below 80 deg. F., shall be protected by special dome placards cautioning employes against removal of dome covers. Such a provision is surely not required for illuminating oil, and in the opinion of the Bureau of Explosives the use of such a placard should be restricted to the real necessities, in order to secure the best results and to avoid carelessness and lack of special attention which always follows the too general use of a special requirement. For transportation purposes it has been the practice in the past to differentiate between the character of the container required for safety, using flash point and vapor tension as a basis.

Recent experiences indicate, however, that the method of making vapor pressure tests, with due allowances for correction on account of initial temperatures, has not in every instance determined the exact hazards, and it is our belief that a preferable and better method of differentiating would be the adoption of a boiling point test. A long series of experiments have been conducted at the chemical laboratory of the Bureau of Explosives and at producing plants. In developing the vapor pressure test it was found that very great differences in pressures were produced by variations in the initial temperature of the gasoline. To compensate for these variations it was found necessary to vent the test vessel or apparatus at a fixed temperature, which was chosen at 70 deg. F. It was afterwards found necessary to make further correction for low initial temperatures by making deductions from the observed pressures. With a view to obtaining greater safety in transportation and greater accuracy and simplicity of test, the adoption of an initial boiling point not lower than 70 deg. F. is now being considered for all inflammable liquids permitted in ordinary tank cars, and the adoption of such a test would necessarily require the use of the special casinghead gasoline tank cars for gasoline or other liquids having an initial boiling point lower than 70 deg. F.

In the use of the term "Unrefined Naphtha," as applied to a mechanical mixture consisting in large part of casinghead gasoline with naphtha from an oil refinery, the value and also the hazard of the article so shipped and described is enhanced by the presence of the casinghead gasoline. The application of special or commodity rates to such a mechanical mixture when such rates are materially lower than those of gasoline appears to the writer to be unfair and deprives carriers of their just revenue for transporting a hazardous and valuable commodity. A finished refinery product consisting of unrefined naphtha or refined naphtha, which has been run through heated stills in conjunction with casinghead gasoline, is usually sold to the trade as gasoline, and from a transportation standpoint there is no misuse of the term "gasoline."

When special or commodity rates were first provided for unrefined naphtha they were also provided for articles described as "Crude Naphtha" or "Unrefined or Unfinished Naphtha," but it is not the writer's understanding that these rates covered or were issued in connection with the shipment of blended products consisting largely of casinghead gasoline. It is our feeling that the oil and casinghead gasoline interests should co-operate for the purpose of arriving at a satisfactory conclusion with respect to proper definitions of their products, and upon conclusion of an agreement the carriers should provide suitable regulations to cover the situation.

Mr. Topping submits in evidence of the necessity of close regulation of gasoline shipments the following report upon a derailment and fire as reported to his bureau under date of October 27, 1917:—

A derailment, caused by uneven track, wrecked eleven cars in a freight train, beginning with the eleventh car from the locomotive. Seven were tank cars loaded with casinghead gasoline blended with naphtha, 3 were empty tank cars and one was a carload of empty wooden oil barrels. The loss by fire, which resulted from ignition of vapors and gasoline by friction and sparks from the derailment, amounted to $25,648.34.

The tank of one of the cars loaded with casinghead gasoline was ruptured by the wreck, releasing its contents so that fire started simultaneously with the wreck. A heavy flow of crude oil from a broken pipeline under the track added to the extent and severity of the fire. The ten tank cars were practically destroyed and the intensity of the heat caused some of the trucks to melt. The safety valves on eight of these tank cars operated sufficiently to prevent bursting of the tanks. But the valves on one of the overturned cars were buried in the ground, preventing their operation. This tank burst, as did another, which had its plates so weakened by the intense heat that the safety valves could not release the suddenly increased pressure.

Investigation by a representative of this bureau shows that the cars were properly placarded, waybills properly indorsed and special dome placards prescribed for tanks containing casinghead gasoline, either blended or unblended, had been used. The lading was described as "unrefined naphtha," which description is permitted by the classification and tariffs in effect for certain specified routings of this blend of casinghead gasoline and naphtha through the section where the accident occurred. In handling the wreck the railroad crew worked on the assumption, from information shown on the billing, that the lading was what is generally known as naphtha. The product known as naphtha does not carry the hazards of casinghead gasoline, and, fortunately, the gas from the vapor tension had burned off before the clearance of the wreck was started.

The presence of dome placards on the cars did not serve to indicate to the men that the lading was very dangerous and must be approached with great care, for the reason that the billing described it as "naphtha," and because of the fact that many times such placards are not removed after the casinghead gasoline is unloaded. The foreman of the wrecking crew states that on account of shippers' failure to remove dome placards required on previous lading, when they reload cars with naphtha, or gasoline which does not require them, he had depended on the billing description rather than on the prescribed placards on the cars to guide him in determining just how dangerous was the commodity involved. This lack of knowledge on the part of the foreman and his subordinates regarding the authorized use of the term "unrefined naphtha" for this blend of casinghead gasoline might have resulted in death or personal injuries on account of the greater danger involved.

As such billing description has not been generally authorized, it becomes necessary for railroad employes to know between what points it can legally be used, if they place dependence on the billing description in judging the degree of danger connected with the handling of such products in an emergency. In case of astray shipments or of cars moving without billing, they must depend entirely upon the placards used on the cars.

The investigation of this case has brought out very forcibly the necessity for a strict compliance with the requirements as to application and removal of placards at the proper time, and that regardless of billing description or other information cautions shown on the placards on loaded tank cars should be observed.

OIL STOCKS IN 1917—WHAT MARKET CONDITIONS HAVE BEEN AND WHAT THEY MAY BE IN 1918.

By J. W. SMALLWOOD,
Carl H. Pforzheimer & Co., New York.

MARKET values for the oil securities during 1917 were determined almost entirely by developments outside of the oil industry. The steady expansion within the oil trade accompanied by unprecedented high prices for the raw material and finished products and their corresponding reflection in record-breaking earnings and dividends were practically ignored in the major price movements of the year.

The complex developments resulting from the entrance of the United States into the war have been the factors determining the course of the oil securities market, and the record shows a gradual depreciation extending throughout the year. It is certain that a large amount of the liquidation in the oil stocks has been for the purpose of supplying funds for government bond issues while a substantial percentage of the selling has also been caused by fear of government regulation and price-fixing for the oil industry. These uncertainties have at the same time deprived the market of buying power.

One Billion Standard Depreciation.

The action of the Standard Oil issues can of course, be taken as representative of the principal developments in the oil securities market. The depreciation in market values of the Standard Oil stocks in 1917 exceeded one billion dollars. The table presented herewith shows that at their high levels, in most cases established in January, the Standard Oil group of stocks has a total market value of $2,760,524,124, whereas at the low levels established near the close of the year these securities represented a market value of $1,703,806,506, a loss of $1,056,717,618 for the year. In other words, these stocks suffered a depreciation in 1917 amounting to half the subscriptions to the first Liberty Loan and equal to one-sixth of the entire amount of bonds which our government has issued since its entrance into the war. In addition to the depreciation in the Standard Oil issues there has been a corresponding decline in the prices of securities of the miscellaneous oil companies running into hundreds of millions of dollars.

Coincident with this tremendous depreciation in values which has been placed upon their securities, the oil companies generally have been enjoying unprecedented expansion in business and earnings and have turned over to their stockholders a record-breaking sum in the form of dividends, although the dividend record would have undoubtedly reached much larger proportions had the majority of the leading companies not adopted an ultra-conservative policy owing to the uncertainties caused by the war. The total cash disbursements of the Standard Oil group for 1917 almost reached the $100,000,000 mark, the exact figure being $99,610,292. This was the largest distribution out of current earnings since the dissolution, although in one previous year Standard Oil dividends exceeded this amount due to a special distribution from previously accumulated earnings. In an accompanying table will be found the record of Standard Oil dividends, by quarters from 1912 to date.

J. W. SMALLWOOD
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Wyoming Stock Advances.

In only one group of oil securities was there any sustained buying movement during 1917. The Wyoming stocks enjoyed an active market with sensational advances extending through the greater part of the year although these stocks were finally affected by the conditions which governed the course of the general market. The development of the Wyoming fields and especially the Muddy field, was one of the outstanding features of the year, and was reflected in a remarkable appreciation in such stocks as Midwest Refining Company and Merritt Oil Corporation. Most of the other miscellaneous oil securities were affected similar to the Standard Oil stocks and generally reached their low levels near the close of the year after a steady decline extending over a period of months. Among the more active and representative issues we find Texas Company stock having declined from 243 to 1[illegible] during the year, Mexican Petroleum Company (common) from 106⅛ to California Petroleum (common) from 30½ to 10¼, and the preferred from 62¼ to 29½. Tide Water Oil Company declined from 225 to 165, Sinclair Oil and Refining Corporation from 63 to 25¼, and Cosden & Company from [illegible] to 5⅞. In the closing months of

year Midwest Refining Company stock declined from 187 to 90, Merritt Oil Corporation from 43½ to 16, Elk Basin Petroleum Company from 14¾ to 5¾, and Sapulpa Refining Company from 12¼ to 8.

Outlook for 1918.

While the tremendous decline in market values has been discouraging to holders of oil securities during 1917, the beginning of 1918 finds these stocks in an unusually strong technical position, and the possibilities of a recovery from the current level appear to be much more favorable than at any time in the past 12 months. While the market has been marking quotations down and has absolutely ignored all favorable reports regarding earnings and assets, the representative companies have been constantly strengthening their financial position with the result that intrinsic values at the present time are far in excess of what they were a year ago, while market prices of the securities are in most cases little more than half what they were at the outset of 1917. In addition to this most of the companies are today paying larger dividends than they were a year ago.

The process of readjustment to war conditions has been carried to such an extent during the past year that it seems fair to assume that the oil stocks have discounted almost any unfavorable developments which are likely to take place in the war situation, and that they are now in a position to respond to developments of a favorable character. In considering the immediate future, probably government financing looms up as the question of most vital concern to investors. It is possible that further large bond issues may cause additional liquidation of oil securities, but in this connection it is well to remember that the oil stocks are not in a class similar to bonds with a fixed rate of interest. Many of the most desirable oil securities show an extremely low return, but are purchased to be held for future developments. In this sense it cannot be said that the oil securities will have to compete with government bonds as a medium of investment.

Three Factors in Prices.

Three factors which may have a distinct bearing upon the course of oil security prices for 1918 are government regulation, stock dividends and peace.

The fear of government regulation and price-fixing for oil has probably been the greatest deterrent to investment and speculative buying of oil stocks during the past year. At the outset of the new year an oil administrator has been appointed, and while the industry has been assured that "it is not the intention of the Fuel Administration to take up the question of price-fixing at present," the possibility of such action cannot be overlooked in any attempt to forecast the action of the market in 1918. Fortunately for the trade, the recently appointed Oil Administrator has had experience in the industry and is reported to have a broad knowledge regarding oil conditions in this country, especially with regard to the producing situation and the dearth of raw material which has been facing the industry. Under present conditions everything possible is being done by the oil industry itself to overcome the discrepancy between production and consumption, and it is almost inconceivable that the Oil Administrator would attempt to solve the problem by reducing prices, the method which has never been known to fail in the industry when it has been desirable to discourage new production. However, should a reduction in prices finally be ordered by the government it would probably be found that the oil securities had already largely discounted such a move, and it is doubtful if action of such an uneconomic nature would cause anything more than a temporary reaction from the present range of prices. But it would undoubtedly discourage any sustained upward swing in the market.

The Stock Dividend Question.

Several weeks ago the Standard Oil stocks enjoyed one of the best recoveries in months following the announcement of the decision of the United States Supreme Court to the effect that stock dividends are not income and therefore not subject to the income tax, but the recovery was short-lived, as the Commissioner of Internal Revenue announced that his bureau would continue to be governed by the express provisions of the present income tax act. The Supreme Court decision applied to a case arising out of the law of October 3, 1913, which contained no express provision for treating stock dividends as income, while the later acts expressly provide for the taxation of stock dividends. The wording of the Supreme Court's decision, however, seems to give ground for the belief that the court might finally decide this provision of the most recent revenue acts to be unconstitutional, for it is certain that this question will be the subject of further litigation. A final decision to the effect that stock dividends are not liable to taxation would encourage stock distributions by a number of companies which are already in a position to recapitalize, and a period of stock dividends would quite likely result in a decided change in the complexion of the market for the oil securities.

Effect of Peace.

The one single factor which would probably have more effect upon the immediate future of the oil securities than any other development is peace. While the industry has prospered with the war, the oil shares are generally placed in the front rank in any consideration of "peace stocks." Should peace come suddenly with oil stocks selling around their present low levels there is every reason to believe that there would be a boom in the oil stocks which would compare favorably with that experienced in 1916. The basis for such an upward movement would be anticipation of a further development of the normal export trade and the marine fuel oil business, which has been held back by the war, together with continued development of the domestic oil trade, especially in motor fuel. At the same time the market would be able to look forward to a cessation of government loans and a lightening of the tax burden as well as the removal of the bugaboo of government regulation and price-fixing.

For some time past there has been quiet accumulation of oil stocks by interests who are willing to retain their holdings until after peace is declared, and in taking advantage of current bargain prices these interests are giving more consideration to intrinsic values than to general conditions affecting the present stock market.

Flood of New Securities.

In recent years investors in large numbers have turned to the oil securities as an attractive and desirable channel for investment, recognizing that the oil industry had been placed upon a solid foundation and that oil stocks were entitled to be placed on a par with other industrial issues as stable mediums of investment. Investors who have used discretion in the selection of oil shares have generally profited to a considerable extent. However, a large amount of money has been attracted by the stocks of new oil promotions, many of them with little merit. To such large proportion has grown the reckless flotation of new oil stocks that it warrants alarm on the part of those who are concerned with the future of the legitimate oil securities now on the market. The quotation lists published in the daily press have grown with leaps and bounds within the past year, but this hardly gives an idea of the promotion schemes which have been in progress during that time. The country has been flooded with literature setting forth the dazzling possibilities of new "prospects."

The staggering total capitalization of new oil companies formed in the United States since the beginning of the war in 1914 is almost unbelievable. The total capitalization of new companies incorporated east of the Rocky Mountains from August 1, 1914, to December 1, 1917, amounts to approximately $1,400,000,000. In addition to this must be added at least $500,000,000 representing incorporations in California and the Rocky Mountain States. The capitalization of new oil companies formed east of the Rocky Mountains last year alone amounted to almost $850,000,000. In Wyoming it is estimated that new oil companies were incorporated at the rate of $1,000,000 a day throughout the greater part of 1917, and an accurate record of the entire country's oil incorporations would undoubtedly show a total for 1917 in excess of $1,000,000,000. At the close of 1917 the combined market value of the Standard Oil stocks was not a great deal more than the amount of last year's new incorporations, notwithstanding that the Standard Oil issues were in most cases selling considerably above their par value. All new oil securities must not be condemned, but diligent investigation should be made before investing, and in most cases it is advisable for the investor to rely on the opinion and judgment of interests who are in close touch with oil conditions.

Cash Dividend Record of Standard Oil Companies.

	First quarter.	Second quarter.	Third quarter.	Fourth quarter.	Total.
1917....	$23,097,668	$26,248,253	$22,861,222	$27,403,249	$99,610,292
1916....	22,179,085	*30,406,454	21,980,168	24,062,168	98,627,875
1915....	15,241,966	14,368,636	15,891,966	16,898,636	62,401,204
1914....	17,904,636	16,426,306	14,430,636	14,931,306	63,692,884
1913....	†55,652,423	15,552,096	16,213,746	21,377,096	†107,795,361
1912....	10,220,396	11,983,746	13,190,396	16,392,096	51,786,634

*Includes $250,000 disbursed by Colonial Oil Company in liquidation and $6,363,786 disbursed by National Transit Company from accumulated assets to reduce its capital 50 per cent.

†Includes $39,335,352 disbursed by Standard Oil Company of New Jersey from repayment of loans to former subsidiaries.

1917 *Range of Standard Oil Securities.*

Company.	High price.	Total value.	Low price.	Total value.
Anglo-American	21	$42,000,000	15½	$31,000,000
Atlantic Refining Co.	1,150	57,500,000	775	38,750,000
Borne-Scrymser Co.	460	920,000	400	800,000
Buckeye Pipeline Co.	123	24,600,000	77	15,400,000
Chesebrough Mfg. Co.	450	6,750,000	300	4,500,000
Continental Oil Co.	660	19,800,000	400	12,000,000
Crescent Pipeline Co.	45	2,700,000	30	1,800,000
Cumberland Pipeline Co.	†165	2,475,000	120	1,800,000
Eureka Pipeline Co.	243	12,150,000	190	9,500,000
Galena Signal Oil Co., pfd.	145	2,900,000	120	2,400,000
Galena Signal Oil Co., com.	190	22,800,000	119	14,280,000
Illinois Pipeline Co.	250	50,000,000	125	25,000,000
Indiana Pipeline Co.	116	11,600,000	80	8,000,000
International Petroleum Co.	15⅝	17,704,697	10¼	11,803,131
National Transit Co.	21	10,689,000	12	6,108,000
New York Transit Co.	240	12,000,000	175	8,750,000
Northern Pipeline Co.	110	4,400,000	94	3,760,000
Ohio Oil Co.	435	261,000,000	280	168,000,000
Penn-Mex Fuel Oil Co.	61	24,400,000	33	13,200,000
Pierce Oil Co.	15¼	8,453,075	8¼	4,572,975
Prairie Oil Co.	700	126,000,000	380	68,400,000
Prairie Pipeline Co.	345	91,150,000	220	59,400,000
Solar Refining Co.	420	8,400,000	270	5,400,000
Southern Pipeline Co.	220	22,000,000	175	17,500,000
South Penn Oil Co.	*609	76,125,000	240	48,000,000
S. W. Penn. Pipeline Co.	120	4,200,000	95	3,325,000
Standard Oil Co. of California	*445	333,750,000	202	202,000,000
Standard Oil Co. of Indiana	945	283,500,000	570	171,000,000
Standard Oil Co. of Kansas	640	12,800,000	405	8,100,000
Standard Oil Co. of Kentucky	*800	24,000,000	280	16,800,000
Standard Oil Co. of Nebraska	650	6,500,000	450	4,500,000
Standard Oil Co. of New Jersey	803	789,657,207	475	467,107,400
Standard Oil Co. of New York	345	258,750,000	220	165,000,000
Standard Oil Co. of Ohio	540	37,800,000	385	26,950,000
Swan & Finch	135	1,350,000	90	900,000
Union Tank Line	115	13,800,000	79	9,480,000
Vacuum Oil Co.	490	75,500,000	315	47,250,000
Washington Oil Co.	40	400,000	27	270,000
		$2,760,624,124		$1,703,806,506

*Old stock. †New stock.

WHAT PETROLEUM CAN DO TO HELP WIN THE WORLD WAR

By ALFRED C. BEDFORD,

Chairman, Board of Directors, Standard Oil Company (New Jersey).

WHEN you ask yourself what petroleum can do to help win the war, you must, in order to answer the question, think of virtually every phase of the war today. The soldier must be equipped. The wheels of the factory that turn out the equipment must have lubricating oil in order to run faster and eliminate a tremendous amount of wear and tear. The engines that transport the soldiers and their equipment to the seaboard must have fuel oil, headlight oil and lubricating oil. The ships that carry the men and the munitions across the sea must have fuel oil and lubricants. On the way to the base headquarters the same thing applies. At the battle front there must be gasoline for the airplanes and gasoline for the trucks that carry the supplies up to the battle line. There must be kerosene for the soldiers in their dugouts, for heating, lighting and cooking purposes. There must be derivatives of petroleum for hospital purposes. In fact, there is not an article turned out in this great war machine that does not require the use of a petroleum product.

Aside from food and munitions, petroleum is the most important product in the war today. In fact, the war could not be carried on without it, and there is not a battle in history in all probability that could have been won had the losing side been equipped as armies are today with machinery and fighting material made possible through the use of petroleum products.

ALFRED COTTON BEDFORD.

Alfred C. Bedford, vice-president and treasurer of the Standard Oil Company of New Jersey from 1911 till December, 1916, when he was elected president to succeed the late John D. Archbold, is now chairman of the board of the company. He is also chairman of the Petroleum War Service Committee of National Defense, and has been identified with the war program since the entrance of the United States into the present conflict. He first entered the employ of the Standard Oil Company in April, 1882.

Mr. Bedford was born in Brooklyn, November 4, 1864, was educated in the public schools and Adelphi College, later completing his studies in England, Germany and Switzerland. He is a member of many clubs and has been actively identified with the work of the Y. M. C. A. His business activities include directorships in many subsidiaries of the Standard Oil Company.

A Great Responsibility.

So a great responsibility rests upon the oil men of America. In no line of industry in the past year have the men so loyally, efficiently and quickly responded to the nation's call as have the oil men. At the President's call, they forgot everything except the need of speeding up output in order to do their part for the men at the front. Oil men who for years had been enemies gathered around the same table to discuss how they best could serve their country and how they all could work together in sharing proportionately the burdens made necessary by our entrance into the war. They forgot old scores, and gladly so. They forgot profits, and gladly so. They had in view only their country's service.

At the request of the government, a Petroleum Committee was formed as a part of the Council of National Defense, and within a few weeks after the President's message asking for a declaration of a state of war, steps were being taken to increase production, to increase refining, to mobilize the oil resources, and to get the products to the factories, to the ships, and to the battle front. To show how effectively the call to the 25,000 oil men of the country was answered, it is only necessary to consider a few facts of production.

Year's Production 328,500,000 Barrels.

In the first half year of 1917, 10,530 wells were drilled, and of this number 7,517 yielded an initial production of 695,708 barrels, or an average of 92½ barrels. In the first half of the year the total production of crude oil amounted to 157,000,000 barrels. In the second half of the year 12,550 wells were drilled and of this number 8,921 yielded an initial production of 821,646 barrels of crude oil. The total production for the second half year was 171,500,000 barrels.

These figures show how the oil men

in the producing field, despite rising prices for drilling materials, piping and labor, took chances and delved into the earth for crude oil producing, in answer to the President's call, more oil in the second than in the first half of the year. The total production for the year amounted to 328,500,000 barrels and in addition we got about 35,000,000 barrels from Mexico.

But this total of 363,500,000 barrels was not sufficient to supply the nation's domestic and war demands. It was necessary to draw upon the crude stocks to the extent of about 20,000,000 barrels. In other words, the total consumption in the United States for 1917 was 383,500,000 barrels. Now, it would not have been possible to consume that amount had not the refiners not only anticipated the country's needs and also bent a tremendous effort and risk of capital to the increasing of the capacity of their refineries. The fact that the refineries of the country were able to handle 383,500,000 barrels of crude oil is proof of the fact that they had made preparations to refine a greater amount of oil than this country could produce in one year.

1918 Task Still Greater.

These facts show clearly that the oil industry in America in 1917 was prepared for the war even before the war came, and not many industries can say that. But a still greater task is upon the oil men in 1918. Oil is to play an increasing part in the winning of the war, and I am proud to express my conviction that the oil men not only will not be lacking, but they will prove themselves forehanded in the great conflict now raging. While more than 8,000,000 barrels of gasoline alone was exported in 1917, it now becomes necessary, with our army swelling to great proportions, with thousands of American airplanes and Liberty motors on their way to France, with thousands of automobiles to handle supplies for our boys at the front, to ship still more gasoline. We must not let one American boy fail for lack of gasoline of the most powerful and purest quality. We must have kerosene for our boys in the trenches and for the soldiers of our allies. We must have more fuel oil for our ships, both of the line and of transport.

If the domestic and war demands for 1917 amounted to 383 500 000 barrels, it is clear that we must have still more crude oil in the coming year. More wells must be drilled, more oil fields must be found, in order to gain vast quantities of petroleum.

Every oil producer in the country today is drilling wells under great difficulties. He is handicapped by the difficulties of getting piping, drilling material and sufficient labor. But he is working. It may be that all the wells these men can drill may not be sufficient. At this critical time it is important that every incentive be given to the wildcatter to take big risks and drill for oil in ground where there is a chance, but there is no surety that his efforts will be rewarded. Drilling for oil is a gamble. It is not like digging a drift for coal where the geologists have shown beyond a doubt that a good-paying vein exists, nor for iron or copper. There is always that element of risk, and encouragement must be given to the wildcatter who takes big chances. If the oil comes from the ground the refiners will do their share, because millions of dollars are today being put into new refineries and in the improvement of old. Scientists are busy night and day in chemical laboratories seeking new methods for extracting the desired products from crude petroleum and seeking new uses for the hundreds of derivatives of petroleum that may be of value in the prosecution of the war. Every oil man realizes the utmost necessity of petroleum to the nation, and every oil man is on the job.

Transportation to War Zone.

The next step is the transportation of all the oil products that are needed to the fighting zone. Thus far there has been a lack of tanker tonnage. Since the beginning of the war the tanker tonnage under the American flag has been practically doubled, but that is not enough. We must have more tankers to bring crude oil from Mexico to the United States for refining, and we must have more tankers to ship both the crude and the refined products to the other side. The oil men have made sacrifices in the past year. They have willingly foregone markets in neutral countries and let their opportunities for trade at high prices in those foreign markets practically die away, because they felt that they must keep the mills running that turn out the munitions of war and they must provide the gasoline, the kerosene and the fuel oil that America and her allies need to fight this war. I do not believe that in 1918 the oil industry will be found wanting in its part in carrying on the war.

GETTING AT THE COST OF PRODUCTION AND THE REAL VALUE OF A GOING BUSINESS.

By RUSSELL G. RANKIN.

ONE effect of the present world war has been to stimulate the interest of the American manufacturer in the question of costs, cost accounting, and their real value in the management of his own business. The governmental method of contracting upon a basis of cost plus 10 per cent., the cost investigations and propaganda of the Federal Trade Commission, and the work of other government agencies, have done much to increase this growing interest; while the changed conditions and competition of the after war period will make accurate and comprehensive cost accounting a necessity in the efficient management of industry.

The effort of the manufacturer in the past has been devoted largely to the upbuilding of plant and machinery, the standardization of products, the establishment of sales policies, and the securing of an adequate organization; while the cost systems have simply grown, without any real constructive supervision.

Cost System a Necessity.

The effort devoted to the larger business problems has been warranted, but a comprehensive cost system is now clearly a necessity, and it should be given consideration. Many existing cost systems consist of a multitude of costly forms and records, in no way co-ordinated to insure the manufacturer either accurate or comprehensive information relative to his actual costs, or the efficiency of his plant and organization. This is due to the systems having originated with one or two essential records, with additions from time to time of many forms and records upon the suggestion and initiative of numerous employes, without the proper consideration being given to the relation of the parts of the system to the whole system and the final results desired. My experience has been in numerous cases that no person in the organization could tell why certain forms were ever started, who started them, or what is the real purpose of such forms.

An accountant instilling a cost system often finds it necessary to eliminate as many or more forms and records than he actually installs, with the consequent decrease in the expense of keeping such surplus records. As a matter of fact, the practical cost accountant—there are many such persons—is often employed to eliminate unnecessary records, rather than to construct additional records.

Qualified Experts.

Although many manufacturers feel the need of improving and strengthening their cost systems, they have a hesitancy about procuring the services of qualified experts. The work of the so-called "Efficiency Expert" of the past is mostly accountable for the manufacturer's state of mind. Efficiency and production work at the present time is being done by qualified and experienced engineers, while cost accounting and systematizing are being done by experienced certified public accountants, with the consequence that the present standard of service can scarcely be compared with that of the past.

Many manufaturers are too apt to consider the installation of a cost system similar to purchasing a piece of machinery. They think the accountants can spend a day or so through the plant, spend some time planning and drafting the necessary forms and records, install the entire system at the end of the next month, and that by the end of the following month it will be entirely completed and in satisfactory operation. The main trouble with such systems is that they are never in satisfactory operation. The manufacturers are to blame for expecting it, and the accountants are to blame for accepting work under such conditions.

The really satisfactory cost systems are installed invariably in the following manner:—The physical plant, the manufacturing operations and conditions, the receiving, storing and issuing of raw materials and supplies, and the duties and personnel of the organization are all carefully studied; the general plans for the system are discussed with the practical men in the concern; the various forms and records are drafted and turned over to the printer; the employes are instructed regarding the operation of the system; and then it is installed a part at a time until the whole system is in complete operation. The accountant usually supervises the system until the satisfactory operation and results are assured. This work requires accountants with a certain fundamental knowledge of the particular industry, and the accountant in charge of the work should be a man of sufficient force and personality to insure the co-operation and support of the employes for the new system. Many well-planned cost systems have proven unsatisfactory, because the accountant could not gain this essential co-operation.

Many manufacturers study their cost accounts only to find that the material can be charged direct to the various products, the productive labor can be also charged direct to the products; but the non-productive labor and other manufacturing or overhead expenses must be apportioned to the various products upon a basis of apparent estimates. They then reason that the cost of production must contain estimates, so why go to the expense or trouble of endeavoring to secure really accurate costs. It is quite true that every cost system must contain some estimates, but still estimates can be made on a scientific or equitable basis and not merely on pure guesswork.

As a matter of fact, every overhead expense account should represent a certain element of manufacturing and have a definite function, and that function in turn should have a certain relation to the various departments and the products thereof. The consideration and allocation of the overhead expenses upon this basis insures quite accurate costs, even though a certain amount of estimating by experience is still required; however, the value of this method over purely guesswork or arbitrary estimates is quite apparent.

The first matter of prime importance which confronts both the manufacturer and the accountant when installing a system is whether the costs shall be based on mass production or unit production. The distinction between mass and unit production is as follows:—

Mass Production Costs.

Costs based upon mass production are calculated by charging the material, labor and overhead expenses to each product for a given period and then dividing this cost by the total quantity produced for the same period to ascertain the average cost during the period. This method is used in plants producing a large quantity of a limited number of products, where the products are costed at the end of each quarter, half year or year.

Unit Production Costs.

Costs based upon unit production are calculated by charging the materials, labor and overhead expenses of each product to each batch or lot produced and then dividing this cost by the quantity of the particular batch or lot to ascertain the cost per unit. This method of costing is very essential in plants producing a limited quantity of a large number of products, where the costs vary considerably and accurate costs are required more frequently than each quarter, half year or year. Costs based upon unit production usually require more clerical work than costs based upon mass production; but, where practical, such costs insure the manufacturer more complete and accurate information.

The value of costs based upon unit production was clearly demonstrated in a large pharmaceutical manufacturing concern, where, under the old system, the actual material cost of each product was figured, the labor costs averaged quarterly at so much per unit of product according to the department, and to the total of these two items was added 20 per cent. to cover various overhead expenses, thereby costing all products, with the exception of the material, at the same cost per unit in the separate departments.

What Is Ascertained.

The new system accurately costed the material, labor and overhead on each formula card or lot through the plant, and as a result the management ascertained the following:—

1. There were many avoidable labor losses between the separate batches or lots of the same products due to faulty manufacturing methods and careless work.

2. There was a large mechanical loss or waste of material which could be eliminated.

3. There was a certain limit to the quantity of products which could be profitably manufactured at one time. As a conseqience, lots or batches were made less frequently, but a greater quantity made at one time depending upon sales and storing conditions.

4. There were numerous special preparations made for physicians actually produced at a loss. It was

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possible to eliminate these to a great extent.

5. There were numerous products this concern could not manufacture at a profit on account of the quantity sold or manufacturing conditions. The production and sale of such products was curtailed.

The management took advantage of every possible increase of efficiency shown to be possible by the new cost system; they sold unprofitable products only when necessary as a part of their sales policy; and they exerted every effort to have the salesmen sell those goods on which they knew there was a reasonable profit. Previously, the salesmen had spent the same effort selling both the profitable and unprofitable products.

Several thousand dollars were invested in this cost system based upon unit production, the management co-operated and studied the various problems with the accountant, they applied to their manufacturing and selling problems every advantage secured through the system; and the profit and loss account at the end of the second and succeeding years proved the system to be the best possible investment.

Surely, no manufacturer can fail to secure for the efficient management of his business the most practical and comprehensive cost system procurable during this period of constantly changing industrial conditions and the prospect of a highly competitive pre-war period!

HOW TO DEVELOP OIL SEED AGRICULTURE AND INDUSTRY IN AMERICA

By HANS SCHLOSSTEIN,
Vice-President, Acme Sales Corporation, Inc.

WITHIN the last three years there has been a considerable demand and consequently advance in prices on all saponifiable oils and fats, which apparently has not yet reached the stopping point. At the same time imports on foreign seeds were considerably reduced for various reasons, such as scarcity of shipping space, embargoes in the countries of production, etc.

To meet the situation increase in production and imports of Oriental oils on a previously unknown scale have been resorted to, but with only partial success.

International developments have now arisen whereby it seems possible that the imports of Oriental oils will be greatly reduced in the near future, on account of foreign manufacturers finding a more profitable outlet for their fats in other countries. Russia, for instance, might make a heavy call for this kind of goods.

For this reason the Southern oil miller may find himself confronted with an enormously increased home demand for various oils and fats, and it would be greatly to his own profit to consider right now how to meet such an opportunity in the most practical and efficient way.

Peanuts and Soya Beans.

The nation-wide campaign for the raising of peanuts on a large scale for oil crushing purposes has so far brought good results, and will undoubtedly cause a rapid development of this industry. Soya bean cultivation has also been undertaken and promises to become an important factor, although on account of the relatively small oil contents of this seed, it might as well be classed as a stock food instead of an oil proposition.

In a recent publication of the Department of Agriculture the cultivation of sunflower seed was suggested. From the oil miller's point of view this seed does not seem to be very attractive, as its hulls amount to about 50 per cent of the whole seed and the average oil content is only about thirty per cent., the latter being therefore not particularly high. The same may be said of the protein contents. Furthermore the plant requires a high potash content in the soil, which at the present price of potash fertilizers will make for little enthusiasm on the part of the farmer.

Rapeseed or castor beans seem to be comparatively much more attractive to the oil miller and consequently as much to the farmer. Castor beans can be raised only in moderate and tropical climates, but rapeseed can be raised in either of these and colder climates as well.

Castor Beans.

In moderate climates the castor plant grows in the form of shrubbery, making new plants every one or two years, while in warmer climates it forms a tree up to forty feet high. The small seed variety, Ricinus communis minor L, is mostly used for medicinal oils, while the large seed variety, Ricinus communis major L, is used for technical oils. The average yield per acre is about 25 to 30 bushels, although it can be greatly increased by improved farming methods.

States in this country in which castor beans could be most profitably raised are Florida, California, Texas, and the southern parts of Alabama, Georgia, Mississippi, and Louisiana.

The government year book of 1904, U. S. Department of Agriculture, as well as the government report of 1913, U. S. Department of Agriculture, give valuable information as to the raising of castor beans and cost of production. However, the question in which the readers of this paper are mostly interested is, How best to utilize the seed in their factories.

Castor Bean Dimensions.

As a matter of general information it may be mentioned that the average measures of hte castor bean are as follows:—

Ricinus communis major L, length, 15 mm.; width, 9.50 mm.; thickness, 6 mm.

Ricinus communis minor L, length, 7.50 mm.; width, 6.00 mm.; thickness, 4.25 mm.

Proportion of hulls to seed, 20-80 per cent.

Fat contents in whole Texas seed, 45-47 per cent.

Fat contents in whole seed from tropical countries, 52-56 per cent.

Fat contents in kernels alone, 60-66 per cent.

Fat contents in hulls, 1-4 per cent.

Water contents in whole seed, 5-6 per cent.

Protein contents in whole seed, 15-18 per cent.

Fiber in whole seed, 15-18 per cent.

Ash in whole seed, 2½-3 per cent.

There is a certain alkolodial, called ricin, contained in the seed, which makes it poisonous. It has an effect such as bacteriological poisens and after having entered the human organism will paralyze in a short time the nerve center of breathing activity. It is the merit of Ehrlich to have discovered an antitoxin against ricin poisoning.

The process of manufacturing the oil is in itself very simple. In making medicinal oils, the hulls are usually removed and the meat pressed cold, but it would be advisable for such mills, which use expellers to crush the whole bean with hulls similar to peanuts, as the high oil contents of the meat alone would be the cause of a great amount of foots, if pressed alone.

The yield in first pressure usually amounts to about 30 to 35 per cent. and there is between 10 to 15 per cent. oil left in the pomace. As this pomace can only be used for fertilizing purposes it is desirable to remove all the oil, which has no fertilizing valle whatever. Therefore the oil is extracted by solvents such as benzol and others.

Cost of Extract Plant.

Of course, the cost of such an extract plant is considerable and would be too high for the average Southern oil mill to install, but a ready market for this pomace could be found among old established Northern castor oil crushers, which are in possession of extract plants, and use these only a part of the time.

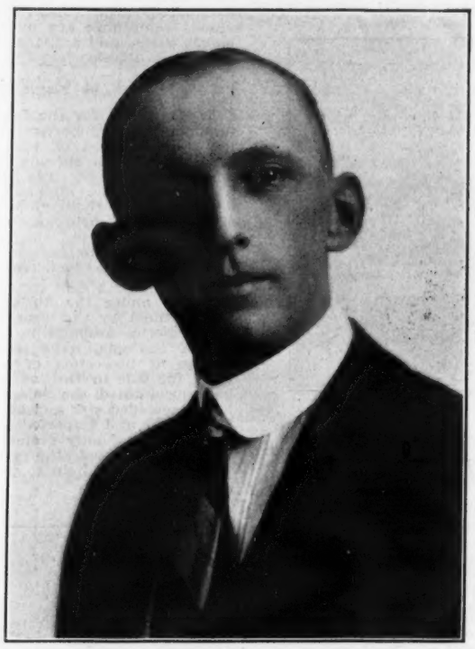
In order to make a medicinal oil out of a cold pressed castor oil it must be refined, which is usually done by bleaching the oil with fuller's earth and filtering it, the whole operation being one in the vacuum. If the contents of free fatty acids is sufficiently low neutralization would be necessary, and the process becomes more complicated as the strong emulsifying qualities of the castor oil prohibit the use of the customary neutralizing methods applied to cottonseed oil. Therefore different patented processes have been devised, such as neutralizing the oil with solutions of alkaline carbonates, phosphates, or borates in methyl or ethyl alcohol or acetone.

The hulls of the caster beans break very easily, and can be eliminated by a simple device such as is used for peanuts and similar oil seeds. Often they are not removed, as explained previously, although in such cases it seems advisable to send the beans through a brushing machine, which removes all traces of earth and dust, that sometimes give the oil a particular taste or odor often met in Oriental oils.

In reference to rapeseed, as previously said, this seed can be cultivated in moderate, warm, and tropical climates. Before the war there were about 350,000 to 400,000 tons of rapeseed pressed yearly in Germany and half of it raised in that country, while half of it was imported. Since the beginning of the war, its cultivation there has probably increased materially.

The cultivation of rapeseed in India amounts to about 6,000,000 acres a year.

HANS SCHLOSSTEIN



Mr. Schlossstein has had a wide experience in the oil industries both in this country and abroad. Following his education in chemistry and practical laboratory work in Germany and Switzerland, he worked for several years in the factory and refinery belonging to his father, Mr. Phillip Schlossstein. This family has been interested in the oil milling business for over a century. In 1912 Mr. Schlossstein went to France as agent for a well known German manufacturer of oil machinery, Am. Kahl of Hamburg. While in this capacity he visited personally most of the French oil mills and had the opportunity to broaden his knowledge in this line. In 1913 he became superintendent of the installation and organization of the first peanut oil factory in Norway, belonging to Consul Johan Bryde of Sandefjord.

In 1914 Mr. Schlossstein entered the employ of Marden, Orth & Hastings Company of Chicago, having charge of the oil department in the Middle West. In this capacity he visited many of the oil mills of the South which are crushing peanuts; and in the fall of 1917 he became vice-president of the Acme Sales Corporation.

Mr. Schlossstein is becoming very well known throughout this country as an authority on oil, especially peanut oil, and has always taken an active interest in the development of American oil seed agriculture and industry.

In Japan rapeseed cultivation has proved to be very successful, although that country only entered the field about 1906. The Japanese seed today is superior to the average Indian seed, and equal to the best German seed.

In South America, especially the La Plata valley, there is being produced a very inferior grade of rapeseed belonging to the family Brassica campetris Oleifera D. C.

The seed best fitted for cultivation in this country would be that known under the botanical name of Brassica Napur Oleifera B. C. biennis. This has an average oil content of 40 to 44 per cent. and can be raised in all States with a moderate climate. The seed could be procured from Japan.

The brown Indian rapeseed Brassica Dichotoma usually has a lower oil content, with the exception of the Toria grades, which contain up to 42 per cent. of oil. The latter probably can be successfully raised in the extreme Southern States in this country. The most desirable kind to cultivate, however, if it could be acclimated in the South, would be the yellow Indian rapeseed called Guzerate or yellow Cawnpore, Brassican Glauca Rexb. The Guzerate has the highest oil content of any of the rapeseeds usually running from 42 to 45 per cent. and gives a very light colored oil, which can be easily refined and even used for edible purposes. The oil cake resulting from Guzerate seed has a light yellow color and is an excellent stock food. Cawnpore usually runs lower in oil content, ranging between 38 to 40 per cent.

Process of Oil Extraction.

The crushing of rapeseed is very simple and would not present any new problems to the Southern oil millers. The hulls of the seed are never removed, because it would be practically impossible to separate them from the meat. Besides they are rather thin, and constitute only a comparatively small percentage of the whole seed.

If the oil is only used for technical purposes the seed is pressed once, and for this expellers or the usual type of cottonseed oil presses can be used. If the oil should be refined and used for edible purposes, it would be advisable to press the seed twice, and in this case the first cold pressure would be performed on expellers, and the second warm pressure on presses. However, there is always a big market for technical rapeseed oil, which is used in manufacturing of artificial rubber, imitation leather, miners' oil, sanctuary oil, and in the blown or oxidized stage as a valuable lubricating oil.

The comparative market values at the time of writing are as follows:—

Castor oil.....30 cents per pound
Rapeseed oil....22 cents per pound.
Peanut oil.....19 cents per pound.
Soya Bean oil..17 cents per pound.

It is thus shown that the adding of rapeseed and castor seed to the seed supply now available to Southern oil millers would be a valuable move. It would mean at the same time another step towards rendering American manufacturing independent of foreign raw materials, which under prevailing conditions is of great importance. Let us co-operate with them.

Great Increase in Postal Savings Deposits at the New York Post Office.

The figures covering the postal savings business at the New York post office, including all branches in both the Bronx and Manhattan, for the calendar year 1917 have just been prepared under the direction of Postmaster Patten. He announces a great increase in the savings for the year, notwithstanding the war, the high cost of living and the millions which have been invested by patriotic citizens of this city in Liberty Loan bonds.

The balance on deposit at the close of the year 1916 was $23,242,524, and this had increased at the close of business for the year 1917 to $29,885,645, the increase for the year amounting to $6,643,121.

There was, likewise, an increase in the number of depositors. The year 1917 opened with 148,365 depositors, and at the close of the year these had increased to 154,378, or a gain of 6,013 persons for the 12 months.

GETTING THE NATURAL DYE MOST USED IN THE UNITED STATES SINCE THE OUTBREAK OF THE WAR—LOGWOOD

A Symposium by Two Large Handlers Treating the Question from Different Angles, but Both Calling Attention to Haiti as the World Producer of This Important Dye Base.

By H. P. DAVIS,

New York and Haiti.

THE perfection by the Germans of synthetic dyes and the world distribution of German aniline dye products had prior to the war so reduced the consumption of dyewoods in America that the logwood industry was gradually reduced to comparative insignificance. But, the great boom in logwood, resulting from the sudden and complete interruption of supplies of aniline colors from Germany, prior to the inauguration of the American aniline color industry, completely altered the aspect of the logwood business in the producing countries.

Before the war the logwood business in Haiti was in the hands of a few firms, the majority of which were German or controlled by Germans. Local prices were fixed by the large dealers who bought either from the "speculators" or direct from the country people, The "speculators" or middlemen, a supposedly necessary evil in dealing with the Haitians, demanded and received a large share of the proceeds of the sale to the shipping merchant, and as many of these men owned or controlled the carts and the burros necessary to transport the wood, their hold on the product wood was and still is to a great extent a strong one.

—Photo by H. P. Davis.

Haiti Virgin Logwood—Such Wood Will Produce from 750 to 850 Pounds 51 Per Cent. Extract to the Ton.

Rush for Profits.

The rapid advance in price and the huge profits made in logwood resulted in the participation in this business of men who knew little or nothing of the trade, either with the natives or with the American market.

A large number of small merchants or traders, including many Syrian shopkeepers, who had no experience in the logwood business, entered the field and their competition caused a rapid advance in local prices.

Very little wood is now coming from Jamaica, which, only a few years ago, was one or the principal sources or supply. Practically no wood is coming from Mexico, principally on account of internal troubles there which have recently been so serious in certain districts that all business has been suspended. A further factor in the temporary suspension of Mexican logwood shipments has been the extortionate rate on freight as well as the lack of steamers for Mexican exports of the wood.

The activities of the customs officials, who, having a short tenor of office, make "hay while the sun shines," are also factors in Mexican shipments. What little woodis shipped from British Honduras and the Belieze supplies are practically all shipped to Europe. Haiti, in spite of the duty of $3 a ton, furnishes the bulk of the logwood supply today, and during the past six months has furnished much more than all other countries put together.

Collecting Haitian Wood.

The bulk of the wood shipped from Haiti has been collected in small lots by "speculators" and merchants who bought of the country people in any amount from one stick to one cartload or more. They paid prices fixed by their competitors.

In some cases the natives who brought the wood to the market divided profits with the men who owned or claimed to own the land on which the wood was grown, and sometimes with the owner of the cart or animal by which it was drawn to the market. There was no organization, and the miserable roads of Haiti, which before the improvements made by the United States Marine Corps, were almost impassable, limited the cutting to land adjoining tht shipping ports and deliveries to seasons during which the roads and trails could be used for wood transportation.

Definite classification of wood or strict rules regarding quality, size or cleaning of sap-wood, were unknown or completely disregarded, and much wood was brought out and shipped which was not worth the freight to American ports. ,

The high prices not only gave the country people profits much beyond anything which they had ever received, but led many of them to give up the collection of coffee, cocoa, and cotton and other Haitian products, all of which are largely collected in the same manner as logwood with system and adequate organization.

Many Caught with Large Stocks.

When the prices began to go down many speculators and merchants were caught with large stocks of wood which had cost them more than they could realize on it, and many of these stocks were of such poor quality that they were unsalable to any responsible dealer. Such stocks afforded an opportunity to a number of more or less irresponsible American traders who sold "Haitian logwood," and delivered "logwood from Haiti," There is not a distinction and a difference. Much of this latter was barely worth the freight charge to transport it to an American port. Some of the shipments, in fact, were so poor in quality that they were a total loss to the purchaser.

Such transactions naturally worked great hardsh.p and 'njury to the American market for Haitian logwood, and by leading the Haitians to believe that wood was salable seriously retarded the efforts of the responsible merchants to keep up the standard of the wood offered in that market.

Many contributing causes affect the market for logwood in Haiti. The country people are simple and totally uninformed regarding market conditions and demands in the outside world. A price once established seems to them to be a fair minimum for future trading, and it is extremely difficult to convince them of the justice of a necessary reduction in price. Many Haitians still hope for a return of the high prices of 1916-1917, and will wait in vain for offers of two and three times the price which there is any possibility of their again receiving.

Crop conditions, and the market for other Haitian products, have a direct bearing on the local logwood market. High prices and a ready market for coffee, cocoa and cotton result in a lack of interest in the production of logwood and a consequent reduction in the amount offered for sale.

Demand Affected by Other Crops.

At present, for instance, the coffee crop upon which Haiti and the Haitians depend for a great proportion of their revenues is, while abundant and of very good quality, practically unsalable. The superior quality of Haitian coffee is not recognized in the United States and the normal markets of France and Holland. Germany is now closed by embargoes and frtight conditions are such that exports are practically at a standstill. As a result many of the country people must depend upon logwood for a livelihood.

If the investment competition of American buyers were removed by intelligent co-operation there would be no reason why logwood of good quality should not be available to supply the demand at approximately the present prices. A good market for coffee or the extension of the castor bean industry, which will in the future employ many laborers, will tend naturally to increase the price of logwood, but for some months to come, until the rainy season again renders the roads and trails difficult and thus checks transportation, Haitian logwood should not sell much under the prices of today.

Buyers can also count hereafter on a decided change for the better in the quality and grading of the wood shipped from Haiti. The irresponsible trader has, to a large extent, been eliminated, both because "you cannot fool all of the people all of the time," and because the great stocks of wood which were at one time the most impressive feature of the landscape in all the Haitian ports practically have been exhausted. The comparatively small stocks remaining are mostly held by enemy aliens and are, therefore, not at present available.

Work of Regulation.

Another, and for the future, a more important insurance against the shipment of logwood of poor quality is provided by the splendid work being done in Haiti by the gendarmerie, which under the direction of officers assigned from the United States Marine Corps, is bringing order out of chaos rapidly, and is helping the Haitian people to redeem themselves and rehabilitate their reputation for their products.

Acting under the authority conferred on them by the laws of Haiti the gendarmerie, assisted by the collectors of customs, have inauguratod a system of inspection of all wood offered for sale in Haitian markets and have prohibited the sale of wood below a specified size and of wood which is unclean and imperfectly cleaned of sap. This not only protects the legitimate dealer and the ultimate purchaser but will help to perpetuate the logwood industry by limiting the cutting of wood too small to be of commercial quality, but potentially valuable for future cutting.

The roads which are being built by the gendarmerie will also make available great areas of virgin logwood which have hitherto been untouched. This will not only supply the market but will result in the shipment of a better quality of wood, as much of the wood offered for sale was limited in size to prices which could be carried readily by burros, the only means of transportation from certain districts.

It has always been understood in the trade that Mexican and Beleize wood would not only yield a greater percentage of hematine, but would produce a superior grade of dye.

The writer's experience has led him to bel eve that this is largely due to the fact that practically all Mexican and Beleize wood is "virgin" wood, and a series of tests and experiments made with Haitian logwood has strenthened the theory that virgin wood does produce a higher percentage of hematine, as well as a superior grade of dye. Jamaican logwood is not today of as high quality as either Haitian, Mexican or Beleize wood, and the weight of experiments seems to prove that this is because of one reason—Jamaican logwood is crop wood, cut every few years—and hence lacks the strength and the hematine content of the "virgin" wood.

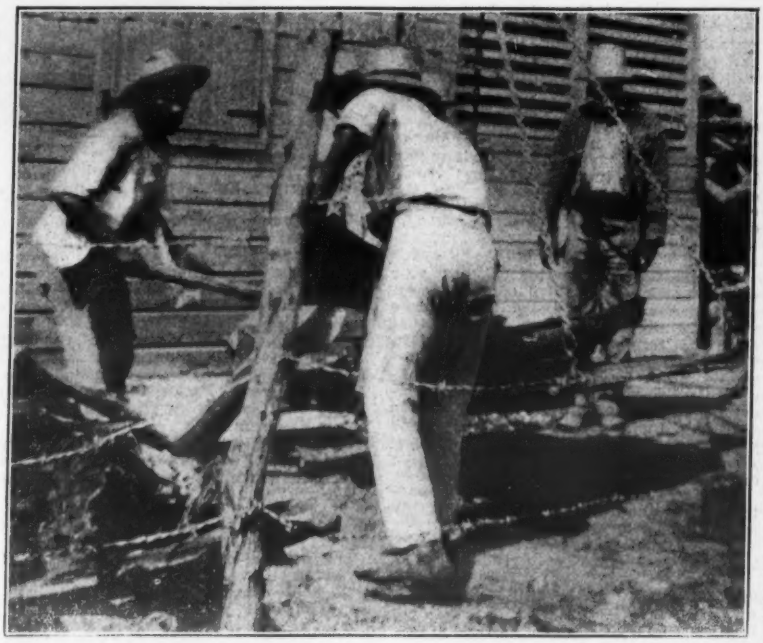
The point made by the writer emphasizes the movement on foot among logwood sellers and purchasers to base the price paid for the wood upon the hematine content as shown by tests of the wood shipped. This would be establishing a new commercial practice as far as logwood is concerned, but the principle is that upon which crude petroleum is sold—the higher the gasoline content of the crude the higher its price.—EDITOR.

By FRED C. THOMAS,

New York and Haiti.

OF the many natural dyestuffs imported into the United States one which shows the greatest increase in quantity brought into the country since the outbreak of the war in Europe is logwood. When the matter of prices is considered this dyestuff is the leader of the list, in that it shows the greatest increase in average price of all the natural dyestuffs. This latter statement is officially made by the United States Tariff Commission. With these two points in view, therefore, some of the conditions underlying the trade in logwood are of great interest to the dyestuffs industry at this time.

Logwood is indigenous to the soil of Central America and the islands of the West Indies, with Haiti and Jamaica as the principal producing islands. To the natives of the islands it is known as "campeache." The trees grow to an immense size if undisturbed by cutters. Dense growths of this wood are to be found on the islands mentioned, particularly in Mexico. The trees are usually to be found at a point starting at the foot of a mountain range and growing up the sides of the mountain to an altitude of 2,200 feet. Growths are also



—Photo by Fred. C. Thomas.

Weighing Logwood in Haiti in the Old-Fashioned Balance.

—Photo by Fred. C. Thomas.
Stacking the Wood Prior to Shipment.

Unloading Logwood in the Yard.

found in the valleys, but this class of wood does not mature to tree-size, running principally to bushy undergrowth unless the soil be dry, as the tree does not apparently thrive in very moist soil.

Wood obtained in the valleys is a very dark red, presumably because of the moisture therein, while the mountain wood runs more to a reddish-brown color and contains far less volatile moisture, giving a larger amount of extract per ton of wood.

Gathering in Haiti.

In the island of Haiti the gathering logwood industry is one of the principal occupations of the natives. The cutters of the wood are known as the "habitants," who work with primitive axes and machetes. After cutting the wood it is stripped of the bark and the thin white sheath wood that surrounds the red wood center. It is a long and tedious process, both men and women doing the work. The wood is next cut into convenient lengths for transportation.

Should the wood be high up on the mountains and the trails difficult, three-foot lengths, to be carried on the heads of the natives, are the rule, while if jackasses (burros) can be used the wood is cut 6 to 8 feet long. If the wood is near the foot of the mountain so that ox teams can be used for cartage the lengths are varying, no standard being maintained. No attempts are made to sort or classify the wood, it being invariably sold "as it runs."

The habitant or original cutter of the wood seldom brings it to the shipping point, merely carrying it to the nearest speculator, who in turn disposes of it to the foreign buyer. The speculator usually maintains a small shack and a piece of land near a cart road. He buys anything from a fifty-pound piece up to a ton and when he has an ox-team load he brings it in to a shipping point where he seeks a buyer. The wood usually passes through two or three hands before getting to the buyer from the United States. The latter purchases from a seaport speculator, who usually gathers a ship's cargo together before offering the wood for sale. The law of the island prevents a white man from buying the wood from the habitant or original cutter of the wood. The speculators are licensed by the government and foreign buyers are allowed to buy from them only. This adds to the cost of the wood.

Labor Is Cheap and Primitive.

The natives usually carry pieces weighing from 60 to 80 pounds on their heads, both men and women, a distance of 15 to 20 miles to a seaport. They generally work only when it suits their fancy, this being particularly so if the price offered does not meet with their views. Native food grows fairly abundant and free for the picking and clothes are not hard to obtain, consisting as it generally does of an old coffee sack fashioned into a crude garment, or a flour sack often still bearing the advertisement on it. Shoes are seldom seen and headgear consists of a primitive turban of simple stuff and gaudy color.

The natives are set in their notions regarding trade and one of the things they consistently refuse to do is to have their offers of the wood weighed on a modern scale. The primitive old type of balance scales are still in use and are usually capable of weighing up to a ton of wood. In the question of weights is another matter that has a vital bearing on the trade from the importer's standpoint.

Sold by Kilo.

The wood is sold by the French pound or French kilo, there being but 2,204 pounds avoirdupois. Importers have to sell their offers on our ton basis of 2,240 pounds, so that if a man buying 1,000 kilos of wood offers it for sale here he has in reality only about .983⅔ tons, American weight. In addition to this there is the matter of shrinkage. The wood shrinks on the voyage from Haiti to the United States on an average of 7 per cent. Weighing charges are paid on the moisture in the wood at the point of shipment, usually amounting to 32 per cent. moisture, which evaporates. Thus loses that much extra weight from the wood he has to offer when it reaches the market in this country.

The weighing of the wood is done in Haiti by customs men there. They are paid for their labors by the Haitian Government from 8 o'clock in the morning until 3 o'clock in the afternoon, but their day's working hours run from 6 a. m. to 6 p. m., and for the hours outside of the regular schedule the exporter of logwood has to pay double time, or for five hours. Naturally, there is not much work done during the government hours. One man checks two scales, or balances.

Ocean Freights.

Another item, and one which tends to keep prices high at this point, is the subject of ocean freights. From $14 per ton and up is asked at this writing, and bottoms are hard to obtain. Facilities for docking incoming schooners have become scarce for lack of sufficient pierage here, and as high as $20 per day has been asked as demurrage charges against schooners. The average unloading of logwood totals about 70 tons a day, and full cargoes run around 2,000 tons and up.

According to officials at Washington who have investigated the subject, the present price of logwood is likely to be maintained. It has been established as a fair standard of price on the island, and the only chance for any considerable reduction in price is a lowering in freight rates. The large stocks of wood which were stored at ports of Haiti a year or two ago have been practically disposed of, and such stores as are now held there are owned by alien enemies, but they are few and on the south coast of the island.

Lack of Standard.

One thing that has heretofore militated against trade in Haitian logwood has been the lack of any standard for the quality of wood offered. Only personal supervision on the part of the exporter prevented the disposal to purchasers of inferior wood. Since American occupation of the island, however, this has been materially altered, and both the United States navy officials and the native gendarmerie are co-operating now to keep up a good standard. This followed an edict by Colonel Tracy, United States Marine Corps, forbidding the bringing into the towns of any wood that had not been properly stripped of its sheath and under four inches in diameter. All caught with bad wood in their possession are now punished by native law.

Uses Since the War.

An example of the extent to which the use of logwood has grown in this country since the outbreak of the war is to be found in the recently issued bulletin of the United States Tariff Commission, dealing with the dyestuff industry of the country. In it is shown that constantly increasing quantities of the wood are being used by cotton, silk and woolen textile manufacturers.

On silk fabric logwood produces blacks similar to certain acid blacks formerly imported from Germany. In 1913 eight American silk manufacturers used 31,000 pounds of logwood, valued at $2,550, while in 1916 they consumed 169,623 pounds, worth $48,236. The average price per pound in 1913 was 8 cents, against 28 cents in 1916. The average increase in quan-

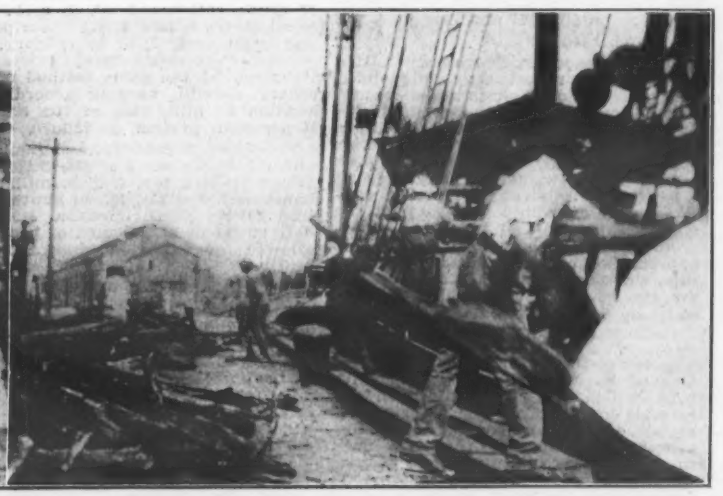
HOW THE LOGWOOD IS PREPARED FOR USE BY THE DYER—EXTRACTING THE HEMATINE

Logwood is discharged from the vessels into box cars and sealed to prevent theft. Moved to the extract plant the cars are unloaded and the wood sorted, the large pieces being split and chipped into small chips which are treated in air by a chemical process for a few days prior to the boiling process, which can best be described as similar to making coffee in a percolator. The chips are packed into a large copper cylinder or autoclave and are boiled under high steam pressure, which raises the boiling point hig above 212 deg. Fahrenheit. This makes it possible to cook the coloring matter out of the chips in a very short time.

The hot liquors are drawn off into vats, chemically treated, and subsequently boiled down to the consistency of molasses in a copper still or evaporator where the water is evaporated by boiling the liquor in a partial vacuum at the very low boiling point of 135 deg. Fahrenheit. The logwood extract is either sold in this form or is further treated with chemicals so that the material undergoes a complete chemical change to hematine, the form in which the color is most available to the dyer. The hematine in the liquid state is usually dried down to a crystalline form to effect a substantial saving in freight rates—the liquid extract is shipped in barrels. The crystals are shipped in barrels in large crepe paper bags or containers to prevent leakage.

Sometimes the logwood extract is evaporated down to such a thick consistency that it is run into wooden boxes where it solidifies in cooling, and in this form it is similar in appearance to licorice and not unlike it in taste.

oto by Fred. C. Thomas.
Darky-Power Carriage of Wood to the Yards.



Stevedoring Logwood on Board Ship.

tity consumed was 447.2 per cent, and the average increase in price was 1,791.6 per cent in 1916 over 1913.

A total of 214,270 pounds, valued at $9,490, was used by 23 cotton manufacturers in the United States in 1913, while the same number consumed a total of 785,641 pounds of the wood in 1916, with an aggregate value of $179,085. This represents an average of 6 cents per pound in 1913 for the wood and 23 cents per pound in 1916 The average increase in consumption was 18.6 per cent, and the average increase in price 317.1 per cent in 1916 over the 1913 period.

Consumption of logwood in 1913 by 25 important woolen textile manufacturers aggregated 712,656 pounds, worth $59,589, as compared with 4,472,424 pounds used in 1916 and having a value of $1,355,145. In 1913 the woolen interests paid an average of 8 cents a pound for the wood, while they paid an average of 30 cents a pound in 1916. This represents an average gain of 527.5 per cent in consumption and an average of 2,174.2 per cent increase in price per pound. Logwood is used by the woolen mills as an important substitute for the producing of various wool blacks.

Known botanically as haematoxylia campechianum, logwood is a mordant dyestuff requiring a metallic mordant to satisfactorily fix the dyestuff upon any textile fabric. Iron mordants are depended upon chiefly, and occasionally tin is used. The fabric is given a logwood bath after it has been properly mordanted with an iron or tin compound.

Textile dyers other than those operating mills used a total of 472,637 pounds of logwood in 1913, valued at $30,472, or an average of 6 cents per pound, as compared with a total of 560,758 pounds, worth $127,098, in 1916, the average price per pound being 23 cents. These figures represent an average increase in consumption of 18.6 per cent and an average increase in price of 317.1 per cent.

Dealers who are reputed to be farsighted aver that they believe the present price of logwood to be a fair one, the natives or country people being enabled by it to make a fair profit for their labors. At the same time it is aiding in maintaining the industry on a standard grade, which will soon be forgotten if present prices were decreased.

AN EVENTFUL YEAR WITH COTTONSEED CRUSHERS—THE RECONSTRUCTION OF THE COTTONSEED PRODUCTS INDUSTRY UNDER VOLUNTARY CONTROL BY THE UNITED STATES FOOD ADMINISTRATION.

By LOUIS N. GELDERT,
Assistant to the President, Interstate Cottonseed Crushers' Association.

SINCE the war has put the imperative into our blood, it is surprising how many supposedly impossible things have been accomplished. To a degree not less than many, and probably more than some other large industries, that of cottonseed crushing has undergone a complete revolution during the past year.

At is annual convention at Dallas, in May last, the Interstate Cottonseed Crushers' Association, following the stirring appeal of retiring President George W. Covington, to the patriotism of the members, unanimously adopted resolutions placing their resources and facilities entirely at the disposal of President Woodrow Wilson for the war's winning. It is doubtful if many members dreamed of the import of that action, and none could have foreseen the radical changes that have been brought about by the government's literal acceptance of their voluntary and patriotic offer.

Serving the Nation.

Inspired by his sense of duty and responsibility, the newly elected president, Fielding Wallace, sought and obtained immediate conference with the officials of the government, including Food Administrator Hoover, at Washington, to ascertain how the organization might best serve the nation in its emergency. The food administration was just formulating the skeleton of its plans, and with other departments there seemed to be no niche for the cottonseed, the products of which, in food and feed value, present and potential, were found to have a strangely insignificient place in the conception of even government officials. Referring to this phase of the situation, President Wallace in his first official letter to members said:—

"Why is it that our industry has been practically ignored as one of the greatest sources of food supply in existence? It cannot be malice or desire to misrepresent facts that are indisputable. Can it be ignorance on the part of those who should know better? Whatever the cause may be, it must be corrected, and will be, I am sure, when our sincerity is better understood and appreciated. With this in view, a committee will be in Washington * * * to present our claims as forcibly and conscientiously as we know how, and keep on doing it until we get what we are entitled to."

In his July letter, President Wallace was able to report very substantial progress in obtaining governmental recognition of the cotton products industry as a great potential factor in the food and feed crisis of the war. With his special committee of leading seed crushers, he spent many days at the capital, followed by further conferences during July and August. In Herbert Hoover, and his broad vision of organized conservation, and in his appreciation of the importance of food fats, was finally found the open sesame for the co-operation which had been so freely proffered to the government.

Council Created.

In compliance with the expressed desire of Mr. Hoover for a committee with which he could advise in the formulation of plans for utilizing the proposed voluntary control of the cottonseed oil mills and their products, the Interstate Cottonseed Products Council was created at a meeting on July 10, at Memphis, when delegates from each state association of crushers met with the Executive Committee of the Interstate Association. This council, as there constituted, consisted of the Executive Committee, with President Wallace as chairman, and Advisory Committees of five persons from each state association. In order to facilitate action and serve Mr. Hoover's convenience, J. J. Culbertson of the Executive Committee was appointed as resident representative at Washington.

Special committees on oil, meal, linters and hulls were also appointed. Followed more conferences with the Food Administration in Washington, culminating in a general meeting in October of authorized representatives of farmers, ginners, seed buyers, state commissioners of agriculture, refiners, packers and dealers, when it was announced that this industry would be put under a license system on November 1, subject to strict regulations governing trading transactions, with limitations of manufacturing costs and profits.

Special Assistant Named.

As special assistant in formulating, amending and interpreting these rules, Mr. Hoover commandeered the service of Hugh Humphreys of Memphis, who thus joined the honorable staff of one-dollar-a-year patriots, whose technical knowledge of the country's industrial conditions was necessary to efficient administration. Mr. Humphreys' experience as a dealer in cottonseed products, together with his level-headedness and self-sacrificing devotion to duty of citizenship, have in a surprisingly short time brought about a satisfying degree of order out of the chaos caused by the long uncertainty and the revolutionary regulations. With him in Washington have been associated J. L. Benton of Monticello, Ga.; Ed. Woodall, of Hillsboro, Texas, representative cotton oil millers of their respective sections, and T. F. Justiss, president of the Texas Ginners' Association. W. E. McCaw, of Cincinnati, has also given valuable assistance with a special knowledge of refining conditions.

The special committees of refiners, compound manufacturers and dealers have been in frequent consultation with the administration, and gradually, following the publication of tentative rules and regulations on November 1, definite interpretations and amendments have been promulgated, to the end that speculation and wasteful practices in the manufacture and trade, may be eliminated, and the industry so controlled that from the producing farmer to consumer of finished products, time and cost may be reduced to a minimum.

There has been no actual fixing of prices by the government, but, what virtually amounts to the same thing, by voluntary agreement the prices of products and manufacturing profits have been stabilized. Thus the price of crude cottonseed oil, f. o. b. mill, in all states is now 17½ cents a pound, and compound, f. o. b. refinery, 22½ cents. Cottonseed meal prices are stabilized by the same method of voluntary control, varying according to location of mill, and on the basis of 36 per cent. protein, as follows:—

Tennessee, Mississippi and Louisiana, and all states west of the Mississippi River, $46.50 a ton, f. o. b. mills; Alabama and Georgia, $47.50; South Carolina, $48.50; North Carolina, $49.50. A deferential of $1 per unit of protein is allowed for variation in protein content.

Splendid Co-operation.

These prices constitute a practical reduction, and, while they were requested by the Food Administration, they were not forced upon the mills. Violations of the agreement, however, have been very few, and as a whole the industry is co-operating with the government in a splendidly whole-hearted and self-sacrificing spirit.

In addition to the above, a differential of $13 a ton was established between the values of manufactured product and the cost of seed delivered at the mills, which takes care of all overhead charges, working expenses, bags, and operating profits. This spread between seed and products is based on certain stated yields of oil, meal, linters and hulls, per ton of seed, which roughly divide seed into two distinct classes, depending on its being grown east or west of the river.

About the only thing that is not fixed by agreement is the price of seed, but in a measure this is automatically fixed by the limitations on operating cost and profit and on cost of products. It is figured, therefore, that seed must be bought at from $70 to $73 a ton, according to quality, in order to produce a profit to the mills. Even profits of dealers and brokers' charges are limted under the regulations of the administration, and the experience of a few of these has demonstrated that the way of transgressors is truly hard.

Stabilizing the Industry.

Many details of the control are still being worked out by conferences between the administration and the mill operators and dealers, but the crushing season is now so far advanced that the best to be hoped for is that the code may be carefully considered and finally amended in plenty of time to assure satisfactory stabilization of the industry in advance of the next crushing season.

Taking it all in all, the cotton oil millers are few, indeed, who do not frankly admit that government control has been a substantial benefit to their business, and of decided benefit to the country. Even the pronounced skeptics in the industry are converted. Some may still yearn for the departed fleshpots of speculation, but these are the bred-in-the-bone gamblers, who have no place in legitimate industrial occupations. For the first time in the industry's history, it is now on a solid manufacturing basis, where profits must depend on efficiency of operations, and the successful solving of milling problems. They are now able to concentrate on the speeding-up of production, for the enlargement of the nation's food supply and the annihilation of the Hun and all that his name means. And throughout the entire industry a new and vigorous activity is evidenced.

Promotion of Crop Growing.

As the time for the next annual convention approaches, the Interstate Cottonseed Crushers' Association is planning a big campaign of promotion for greater production of oil bearing crops in the South. Efforts will be made to induce the planting of a large acreage of soy beans. Peanut acreage will be still further increased, although over 3,000,000 acres of peanuts last year had more than doubled the production of the previous year. Some sections will plant sun-flowers this year, and oil millers are interesting themselves to obtain the best varieties of seed. In Texas, particularly, many mills have gone into the peanut trade exclusively, and are producing peanut flour, butter and other products.

A vigorous campaign for new members was conducted in August, 1917, under the leadership of Vice-President R. E. Montgomery, resulting in nearly 150 being added to the roster. Georgia led in this respect with nearly 50 new members to its credit. On account of the important co-operative work of the association with the food administration, it is now believed that another effort this Spring will be successful in making the membership of the Interstate Cottonseed Crushers' Association practically a directory of the trade.

The Traffic Committee of the association, under the chairmanship of J. H. Johnston, of Oklahoma City, has been particularly active during the year, in co-relating the work of the traffic managers of the state associations, and larger companies, and co-operating with the railroads in car space conservation and the prompt movement of products.

Publicity Work Done.

Early last year, the Executive Committee, under the authority of the previous annual convention, created the office of assistant to the president, and appointed Louis N. Geldert to perform its duties and to edit and manage the Cotton Oil Press, the official monthly bulletin of the association, at Memphis, Tenn. Following the death of Col. J. W. Allison, of Dallas, in May last, the Publicity Bureau was removed to Memphis, and also placed under Mr. Geldert's management. Through this new office an active educational propaganda is being carried on, with the Cotton Oil Press as its leading feature. Its favorable effect is being felt throughout the entire trade. A series of public exhibits of cottonseed and allied products has been inaugurated, beginning with the Patriotic Food Show in Chicago last month, where it attracted much favorable attention.

The recent order of the food administration that bakers, as well as housewives, use substitutes for wheat flour in stated percentages in baking, has brought cottonseed flour into new prominence, and emphasized the astonishing dereliction of the cotton oil millers in not providing for its greater production. Only two or three mills are, as yet, making and marketing it in commercial quantities, and their product cannot begin to supply the demand. Many large bakers in New York, Boston, Philadelphia, and Chicago, after satisfactorily experimenting with cottonseed flour, were obliged to cease using it because they could not be guaranteed a regular delivery. The Publicity Bureau of the association is now assured, however, that within sixty days several more cotton flour mills will be in operation and that there will be a large production next fall and winter. Cottonseed flour is now included in the official list of substitute flours, the use of which is ordered by the food administration.

Oleomargarine Tax Law.

The Interstate Association has interested itself actively during the past year to secure the repeal of the iniquitous oleomargarine tax law. Food fats in largely increasing supply are absolutely necessary in the great war emergency, and, while greater production is being urged and demanded the manufacturers of oleomargarine are burdened with what its instigators originally intended to be prohibitory restrictions. The public now demands that all taxes be removed from foodstuffs, and Congress continues to sit on the lid. The Aswell Bill, now in the Ways and Means Committee of the National House of Representatives seeks to free food from all taxation and, among other things, to allow the scientific mixing and compounding of vegetable oils with milk, under the safeguard of the present Pure Food and Drug laws, but without the prejudice and stigma of taxes and licenses that hamper the product's sale and use.

As one result of the efforts of the association to increase the country's supply of food fats, it is expected that the large number of cotton oil mills, as soon as this season's crush of cottonseed is over, will fill in the usual between-season period by crushing copra depending upon the supply that can be obtained. The Bureau of Commerce at Washington has interested itself in securing shipments, but the scarcity of ships will be a serious handicap. Some considerable cargoes are on the way and every reasonable effort is being made to give the mills the necessary material. The use of cocoanut oil is increasing very rapidly in what is known as nut margarine.

While the past year has been, beyond question, the most eventful in the history of cottonseed crushing, it has also been the most progressive. While business has been turned topsy-turvy level heads have seen to it that the landed squarely on its feet, prepared to serve the nation and its battling allies, as few other great industries can claim, with a well-organized program that looks not only to speedy victory but to lasting peace and prosperity

HOW UNCLE SAM ENSURES CASTOR OIL LURICATION FOR AEROPLANES AND HEAVY DUTY TRUCKS

THE close of the year 1917 was marked by the initial steps toward the development of a new vegetable oil industry in this country —the growth under government supervision and under government contract of castor beans from 100,000 acres in this country, to which will be added many thousand more acres in Haiti, San Domingo and Cuba.

The demand for castor oil above the normal requirements of the country is purely a war-time development. The manufacture of thousands of Liberty motors for heavy duty trucks and for the thousands of areoplanes which are to be used in our offensive against the Germans has called for an almost unbelievable amount of castor oil, since that vegetable lubricant has been proved par excellence the best for aeroplane use where rapid changes in altitude and in temperature wreak havoc with ordinary lubricants. Castor oil is the only lubricant for machinery which will operate continuously and successfully at different altitudes and under different temperatures.

Realizing the immense need, and also realizing the fact that the normal output of castor oil from foreign seeds—as has been the custom in the past—could not provide for the necessities of the airship fleet and for trucks, the United States Signal Corps made a close census of probable requirements, and then, under the advice of Federal plan-specialists, including Dr. W. W. Stockberger, of the Bureau of Plant Industry, placed contracts for thousands of acres of castor beans in this country and in the islands of the West Indies—Cuba, Haiti and San Domingo—to the end that when the motors were ready there might be no shortage of the necessary lubricating oil.

India Former Source of Supply.

The world has heretofore been dependent upon India for the castor oil supply, although small quantities have been received in this country from Haiti, Hawaii, Cuba and other tropical islands and countries. The India supply has been cut off by the direct action of Great Britain, which requires every drop of oil obtainable for use by its own air fleet, and every castor bean shipped from India now goes through the hands of the British Government. When the United States completed its plans for seeding down from 75,000 to 90,000 acres of castor beans in this country the British Government released 6,330 long tons of beans for seed sufficient to plant the acreage first to be placed under seed through the newly completed contracts with farmers.

Data as to Contracts.

These seed beans are being distributed by the Signal Corps to the farmers of the South, who contract to grow castor beans exclusively for the government, with the understanding that the seed beans need not be paid for until such cost is deducted from the government's check for the first shipment of beans made under the contract. These contracts are of two types, since the government will make no contract for less than 1,000 acres. Holders of such contracts are allowed to make sub-contracts with the small farmers who will grow five, ten or even 50 acres. Those who make their plantings in March can expect to be paid for their yield in beans early in July. The government price on large acreage contracts is at the rate of $3.50 a bushel f. o. b. shipping point. The specified rate of payment of the small acreage sub-contracts is $3 a bushel (46 pounds) f. o. b. shipping point. Under these sub-contracts the farmers are required to plant a specified number of acres as soon after March 10 as directed, with seed to be furnished by the holder of the principal contracts, and to thresh, pack and deliver to the nearest railroad station. A bond at the rate of $1 an acre for each acre sown is required from all sub-contractors.

Where Castor Beans Can Be Grown.

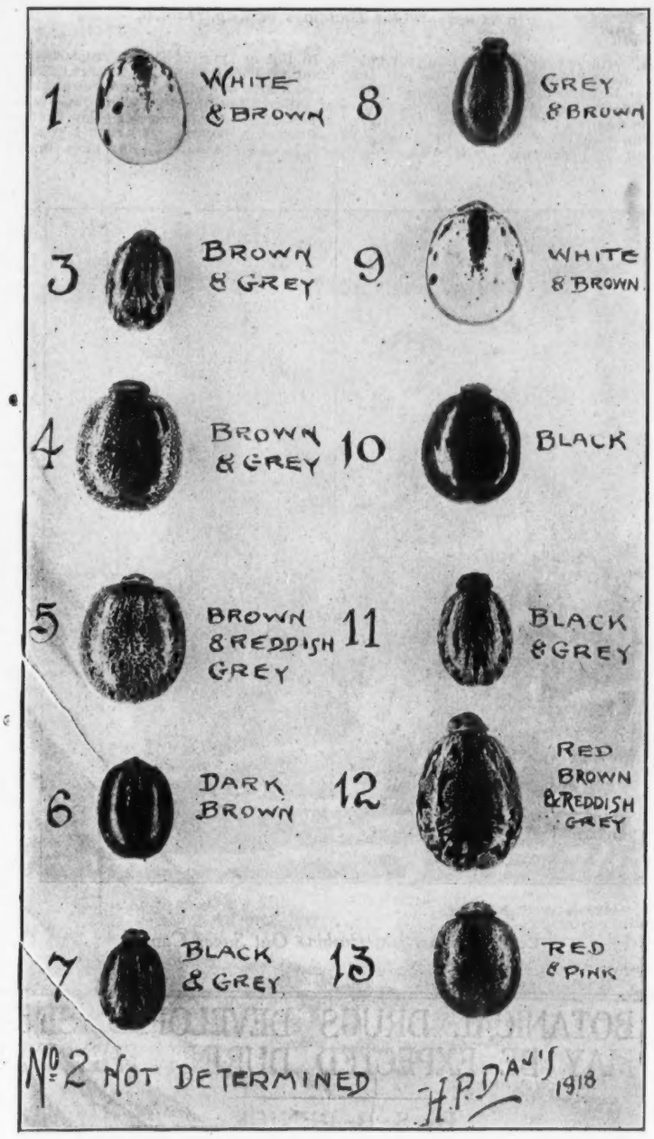
The castor bean was once an important crop in certain sections of Oklahoma, Kansas, Missouri and Illinois. However, during recent years ample supplies of castor beans from India have been laid down in this country at a price lower than our farmers could afford to produce them; consequently the industry has practically disappeared in the United States.

For the commercial production of castor beans, the warm climate and longer growing season of the more southern States is necessary. If planted much further north than St. Louis, Mo., or Washington, D. C., the crop is very likely to be caught by frost.

In general, fertile soil which produces good crops of cotton or corn is suitable for castor beans, but a very fertile soil favors the growth of the plant at the expense of seed production and early maturity. The land is prepared in much the same manner as for cotton or corn—that is, plowed, disced and harrowed level before planting, which may be done with a corn planter with specially prepared plates. The time of planting varies, according to locality, but in general corresponds to that of cotton. A good time for planting in Central Oklahoma would be about the first of May, and correspondingly earlier in localities to the South.

Probably the most desirable variety to plant commercially is known locally as the Indian, or Bombay, bean.

HAITIAN CASTOR BEANS—NATURAL SIZE, WITH COLORS INDICATED.



Oil tests of content of oil in the above Haitian beans show the smallest oil content to be 40.60 per cent., and the largest, 57.11 per cent., total fats by the ether test. The following are the percentages by number of bean:—1—55.65; 2—undetermined; 3—45.95; 4—57.11; 5—50.89; 6—45.65; 7—44.45; 8—44.08; 9—40.60; 10—50.90; 11—45.11; 12—50.22; 13—53.98.

The ground was prepared just the same as for corn, and the beans were planted with the same two-horse corn planter, with check row attachment, so that the field could be cultivated both ways. This enabled the crop to be kept free from weeds with very little or no hoeing. The crop was cultivated just the same as corn. The number of cultivations depended upon the season, but was usually from three to five times. The last cultivation was usually about the last of June, but it could continue until the plants were so large as to be in danger of being broken by the cultivator. The plants usually grew to a height of five to seven feet.

The beans of this variety are oval, smooth and shining, of a gray ground color, irregularly marked with brown. They are about two-fifths to three-fifths of an inch long and one-quarter to two-fifths of an inch broad. These beans usually run from about 1,200 to 1,500 to the pound, or about 55,200 to 69,000 per bushel of 46 pounds. A smaller variety formerly grown in Kansas runs about 2,500 to the pound.

Castor Beans in Kansas.

For several years one of the main, ready-money, producing crops of Southern Kansas was castor beans. Most farmers in that section planted from 40 to 60 acres, and prices ranged from 80 cents to $2 per bushel. Later, on account of the importations from India, prices were lowered, and Kansas farmers almost discontinued raising the crop.

The only variety grown in Kansas at that time was the "poppers," and the first picking or cutting was about the last of July.

Type of Oil to Be Used.

The Signal Corps proposes to use only No. 1 cold pressed oil, and there will be many important by-products of great value. For instance, the pulp discharged at the crusher after the oil has been extracted is an excellent fertilizer. It is hoped also that in addition to supplying the needs of the Signal Corps for lubricant, there will be sufficient to meet the requirements of other lines of trade, such as the high-grade soap makers, the manufacturers of flypaper, pencil manufacturers, the makers of imitation leather and the scores of other commercial uses to which castor oil is put.

The Signal Corps is working with the closest co-operation of the trade. The Federal Trade Commission has made careful surveys of the industry and placed all available statistics before the officers of the Signal Corps. Conferences have been held with the oil crushers and a working agreement has been reached. The finest spirit of mutual helpfulness has been shown. A standard price is to be fixed, so that there may be no profiteering, but that all persons engaging in the production of castor oil, both grower and oil mill men, may have a fair and generous profit.

Authority to Commandeer.

Under the National Defense Act the War Department has authority to commandeer whatever product it needs and to force the growers or crushers to meet its terms, but in the present case there is no need for exerting such authority, as all interests have united to produce the oil the government wants at satisfactory terms.

The Signal Corps has authority also to control the oil supply from any imported bean, so as to make the product meet the price schedule set by the United States Government.

The soap manufacturers, many of whom use castor oil extensively in the making of high-grade soaps, have voluntarily placed their entire supply at the disposal of the Signal Corps. This forms an important reserve for emergency calls until the new American crop of Indian castor beans can be harvested.

Lieut. Col. Charles Van Way, who has been in charge of letting the contracts for growing castor beans, and Dr. W. W. Stockberger, who has been in charge of the investigations and negotiations for the Department of Agriculture, agree that, besides performing a patriotic duty in supplying one of the great war needs of the government, the farmers will be restoring a great industry to this country.

How Florida Came to the Fore.

In point of view of both climate and soil advantages, Florida was looked to by the Federal authorities as the most available acreage in the country. Contracts have already been placed in the Palmetto State aggregating 50,000 acres, and the first contract was given to D. Collins Gillett, former president of the Tampa Board of Trade and an organizer of the South Florida Chamber of Commerce. Mr. Gillett holds a contract from the government for 10,000 acres to be planted in castor beans, and will divide his territory under the sub-contract plan. He states that castor beans have been growing wild in Florida for the past fifty years, and that nearly 2,000 acres were planted last year in Lee county, that State. Those which survived the overflowing of the land made a satisfactory growth and a profitable yield entirely without the use of fertilizer.

Other Florida contractors are B. L. Hamner, Vance W. Helm, Herman B. Walker and G. G. Ware. Mr. Hammer, in arousing interests in the proposition, makes the following pithy points:—

One man and a mule can cultivate from 15 to 20 acres.

Florida will plant at least 35,000 acres.

Any fair land should produce 20 bushels to the acre, and an average of 30 bushels to the acre is expected from the entire State.

Yields as high as 60 bushels to the acre are not impossible, since in Mexico yields as high as 112 bushels an acre have been grown.

A crop matures in from 60 to 90 days from the time of planting.

The United States guarantees to take the entire crop at a price of $3 a bushel from the farmers, war or no war.

The acreage already contracted for, as given out at Daytona, Fla., totals:—

B. L. Hamner and Howard Curry, North and West Florida, 10,000 acres; D. C. Gillett, Southwest Florida, 10,000 acres; G. G. Ware, Lake County, 5,000 acres; Helm and Walker, East Coast from Volusia County south, 10,000 acres.

Texas May Produce 5,000,000 Bushels.

The demand for the oil from the castor bean will meet with a wonderful response on the part of the farmers of Texas. It will not be surprising, it is stated, if more than a hundred thousand acres are devoted to this new crop this year. It has been demonstrated in a small way that the yield of castor beans in Texas runs from 40 to 60 bushels per acre, with perhaps about 50 bushels as an average, as compared with an average yield of about 30 bushels in the more northern parts of the country. If there should

TYPES OF GROWTH OF CASTOR BEANS IN HAITI IN DIFFERENT LOCALITIES

—Photo by H. P. Davis.

In Ruins of Old Buildings. *In Ruins of Old Buildings at Cap Haitien.* *In Yard of Native Farmer.*

be 100,000 acres placed this season, it would mean a possible yield of about 5,000,000 bushels.

The United States has entered into a contract with Leon C. Hill, a large planter of the lower Rio Grande Valley, with his home at Harlingen, to grow 10,000 acres of castor beans this year. At a meeting of the farmers of Bexar County, in which San Antonio is situated, held a few days ago, pledges were signed for the planting of 10,000 acres of the new crop. Similar action has been taken by the farmers around Pearsall and of other localities of South Texas.

It is claimed that the soil and climate of South Texas and East Texas are splendidly adapted to the growing of castor beans. As a matter of fact, this product was extensively grown in East Texas about thirty-five years ago. With the discovery of mineral and other oils the demand for castor oil decreased to such an extent as to make the industry no longer profitable. In South Texas, where the farmers are co-operating with the government in the proposed growing of the castor beans, the land that is to be devoted to that crop must be first selected and passed upon by agricultural experts of the United States Department of Agriculture.

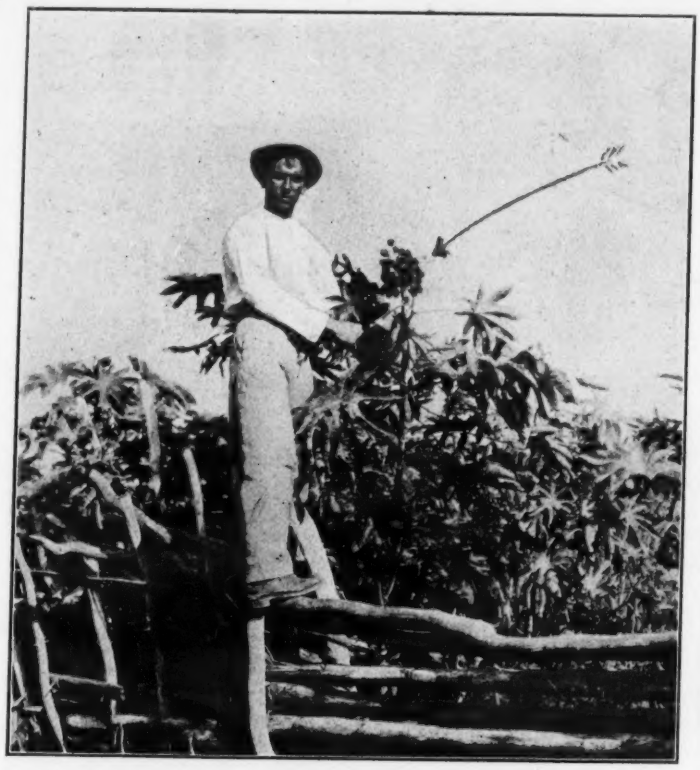
It is known that castor beans are drouth resisting and that they are well adapted to the more western portion of the State, where the rainfall is often too little to produce the more standard crops.

Development in Cuba.

Interest in the growth of castor beans in Cuba was intensified following the return from this country to Havana of Captain George Reno, of the Cuban Department of Agriculture and Commerce. Captain Reno was in close consultation with Food Administrator Hoover and other Federal officials at Washington, and, since the castor bean grows wild in Cuba, saw no reason why exports of beans from that island should not be increased immediately.

The result has been that since his return about forty firms and individuals have become interested to the extent of planting castor beans in Cuba, with several of the more prominent plantations in the Province of Pinar del Rio. The Compania Cuba Agricola Industrial has large plantings of the beans in this province, but harvesting has been delayed by delay in receipt of necessary machinery.

In Santo Domingo the principal contract is in the hands of General Elizeo Expaillat, one of the most prominent of the Dominicans, who has 5,000 acres of castor beans in the eastern end of the island. General Expaillat is one of the most popular men on the island—he has twice refused the presidency—and there has been no difficulty in handling the various subcontracts.



—Photos by H. P. Davis.

Castor Bean Plant Pushing Out Sugar Cane.

The availability of Haiti as a source of castor beans was brought to the attention of Lieutenant Colonel Charles Van Way, of the Signal Corps, by H. P. ("Horse-Power") Davis, well known as a logwood shipper and handler of other Haitian products. Mr. Davis brought with him to Washington a collection of castor beans—which are illustrated in connection with this article—and, after careful examination by expert chemists, it was discovered that these beans had an oil content ranging from 40 per cent to 57.99 per cent. Mr. Davis pointed out the climatic and other advantages of Haiti, which would insure the production of three crops a season, and instanced the enormous acreage of productive land available which had not been generally cultivated since the expulsion of the French in 1804.

The gendarmerie of the island have taken an interest in castor bean production and will insure good crops and immediate shipment of beans as soon as harvested, declared Mr. Davis. No figures are available as to possible production of castor beans in Haiti, but unofficial tests have shown that one planter in San Domingo has obtained as high as 79 bushels an acre from one planting, and in Haiti it is hoped to average at least 45 bushels an acre, although Mr. Davis's 5,000-acre contract is based on an estimate of 30 bushels to the acre.

As a resident of Haiti Mr. Davis is principally interested in the creation of a new industry, with the advantage that the country people will be given a new and permanent source of income.

The Haitian crop will mature in 1 weeks, and it is claimed that the producers of that island will have on advantage over Florida growers i that the crop is perennial.

The government's action in providing for future demands of castor o by the provision of seed and by th guaranty of an unusually good pric for the beans is ample assurance o the success of this new departure an removes it from the experiment clas at the very outset.

NEW SOURCES FOR BOTANICAL DRUGS DEVELOPED SINCE THE OUTBREAK OF WAR MAY BE EXPECTED DURING THE YEAR 1918

By S. B. PENICK,

S. B. Penick & Company, New York and North Carolina.

SINCE the outbreak of the world war very material changes have been effected in the sources of the crude botanical drugs entering into consumption in the United States. Prior to the outbreak of hostilities and for long years in succession American consumers, due perhaps to an easy-going attitude on the one hand, and a limited range of requirements, were content to depend upon Germany and Austria for a wide variety of botanical drugs, with the result that these drugs were standards in quality and quotation in the prices current and in consumptive demand.

With the advent of war, the closing of the allied embargo around the Central Powers, and the development of sea raids and scarcity of bottoms even before this country entered the war as a participant, it is not to be wondered at that confusion amounting almost to consternation followed the elimination of these established sources of supply.

Experience Was of Benefit.

The effect upon the American consumer was a radical one. Some went so far as to express openly their b lief that there was an end to indu tries requiring botanicals of foreig origin until, at least, Central Euro was again available as a source supply. But, fortunately, no such rad cal development followed. In fact, a though the experience was a partic larly trying one—and by no mea confined to the botanical drug indu try—the result has been unforese and doubtless lasting benefit to t nation and to the growers and co sumers of botanical drugs.

Belladonna Crop of 1917.

Consumption Has Lessened Year Year.

For many years the consumption botanical drugs in the United Stat has been smaller year by year. T modern drug store, with its vari line of scientific pharmaceuticals, fr sources other than vegetable, h done much to discourage the form widespread use in the home of he simples. A similar decreased use also manifest on the part of the ma facturing houses. As we had d virtually no export business prior

Three Acres of Digitalis in Bloom.

Iris Florentine in Bloom.

the war we had little reason to seek original sources of drug supply, and we did not even realize or remember that Germany and Austria did not control the culture of many of the drug products sold by them to us.

Possibly a full year elapsed before the desire on our part to be supplied with certain drugs was coupled with just as urgent a desire on the part of growers in more or less isolated parts of the world to sell to us, and months elapsed before these two essential factors in world commerce began to co-ordinate.

Then, too, there were unusually heavy demands made upon this country by other nations which hitherto had obtained these drugs from the Central Powers, with the result that a decided impetus was given to the botanical drug industry of the United States. In addition to the growing domestic demand, South America now looks to us to be supplied, and many of the neutral countries of Europe, as well as those countries in the Far East also barred by war-time embargo, are now turning their orders into this market.

New Sources for Supplies.

It is interesting to note the new sources for some of the botanical drugs in steady demand in this country:

Angostura bark, simaruba bark, jaborandi leaves, sabadilla seed, rhatany root, soap bark, and many other products, the initial sources of which are in various sections of Central and South America, are now obtained direct. Formerly these were largely imported from Germany.

We now get our henbane leaves, valerian root, ergot, wormseed, muskroot and calamus root from Russia and the allied countries. These formerly came to our hands through Hamburg. Japan has replaced Austria, Montenegro and Dalmatia in supplying us with our pyrethrum or insect flowers, as well as valerian root.

Italy has readily taken care of the world demand for arnica, montan flowers, orris root, colchicum root and seed, bryonia root, cut althea root and other drugs formerly obtained through German channels.

In fact, when the complete list of imported botanicals is examined carefully we discover that there are few, if in fact any, important drugs upon which we must absolutely depend upon Germany. Certainly there are not more than half a dozen in all.

Growing in United States.

Shortly after the beginning of the war a propaganda was organized to encourage the production in this country of important botanicals, of which it was thought we would be deprived unless we could cultivate and raise our own supply. After considerable hysterical writing on the part of the many who knew nothing of the commercial or the scientific branches of the work, the net result of the agitation was found to be an attempt on the part of a few interested parties to produce five or six of the most promising looking botanical drugs. Today, although this work has grown gradually to considerable size and importance, only the following have been produced on a scale to make them of importance:—Belladonna leaves, belladonna root, cannabis, digitalis leaves and henbane leaves.

In the fall of 1914 some experimental work was done which resulted in the growth of but a small supply of these varieties, but which did result in a demonstration that their raising could be accomplished upon a commercial basis. Each year since the first war year has seen a marked increase in quantity—and a striking increase in quality—until at the present writing the grade of our domestic cultivated drugs surpasses any obtained from foreign sources in the past. We have reason to be particularly proud of our belladonna leaves which, by the scinetific method of selection and breeding employed by the growers, have been produced with an alkaloidal content of as high as 1 per cent, or more than three times the strength specified by the United States Pharmacopœia.

In addition to these cultivated drugs there are others which we were compelled to gather from the wild crops of our country to supply our needs when no more were to be obtained from Europe. We soon found that a very choice grade of genuine dog-grass could be gathered in unlimited quantities throughout the Northern sections of this country, and that our dandelion root was far superior to any that Germany had sent us, while our collectors were not given to mixing it with chicory and other spurious products as had been the case with the root of foreign origin. Elecampane root, an article in large demand, we soon supplied, and at practically normal prices, from our domestic crops.

Hellebore root has long been one of our most dependable insecticides of which Austria supplied the bulk. We now find ample supplies of unusually choice quality right here in this country.

What is true of the above-named items can be said of a score of others, and it is possible that some day some drug raiser in Germany may contribute to the pharmaceutical press a similar article on "New Sources of Botanical Drugs," when the United States is called upon to supply the post-bellum German demand.

From present indications the supplies required of botanical drugs will continue to reach our markets in reliable quantities with the arrival of each season, and we have every reason to expect a fairly normal condition during the season of 1918.

S. B. PENICK

Of S. B. Penick & Co., Inc., Growers of American Botanical Drugs.

S. B. Penick is a native of Virginia, and began his business carreer at Lynchburg, that State, with the Strother Drug Company. He was soon sent to Bristol, Tenn., as manager of a branch, and later in June, 1904, came to New York and engaged in the crude drug business. In June, 1914, he entered this business on his own account, organizing S. B. Penick & Co., Inc.

Believing there was an opportunity for a wider range of action in American botanicals, he established his business in western North Carolina (Marion), the heart of the domestic drug-growing section of America, and where fully 75 per cent. of all American botanicals either grow or are cultivated.

As his business in Marion developed, the need of foreign connections manifested itself, and a branch at New York was considered essential. A branch was established here in 1915 and within a year the transactions of the branch were exceeding in importance those of the parent house. Mr. Penick then removed his headquarters to New York, where several buildings are now occupied by the firm, with the North Carolina house still maintained as a branch.

Mr. Penick is a keen student of his business in all of its phases, and has written a number of articles of a scientific-commercial nature; is an assiduous worker, and keeps the details of his business in his grasp.

Hydrastis in Bloom.

American-Made Potassium Carbonate and Caustic Potash

B. P. R. HERSHMAN, Ph. D.

Former Chief Chemist, Research Laboratories, Armour Fertilizer Works, Chicago, Illinois.

POTASSIUM carbonate, so essential for the production of hard glass, and quite indispensable in the manufacture of optical lenses, cannot be obtained by a process used in making sodium carbonate by the Solvay method. It can be produced by the Leblanc process, but this is a tedious operation, requiring complicated apparatus and involving loss of potassium by volatilization.

The stocks obtained from abroad before the war were practically exhausted early in 1917. At that time I worked out a wet process which has given good results on a large scale, and permits the use of potassium sulphate about 90 per cent. pure as raw material. The resulting potassium carbonate is entirely free of sulphates, sulphdes, sulphtes and iron. A small amount of sodium carbonate, which is usually present, can be removed by recrystallization, and the product thus obtained then comes up to the requirements of the U. S. P. This process i snow used by the Armour Fertilizer Works and by the American Potash Company of Illinois, which latter now also uses potassium chloride as raw material; this has the advantage of permitting the elimination of sodium compounds at the same time.

Caustic potash has been manufactured by a number of firms during the last year, and I have introduced a process of my own to the Chemical and Research Company of Illinois. The products produced in our own country are now equal in quality to any foreign standard. Caustic potash is marketed either as fused solid or (an American innovation, which saves fuel to the producer and trouble to the consumer) as a liquid containing 40 to 50 per cent of K O H. In case a particularly pure product is required, this will be found in the potassium hydroxide hydrated, crystals 99 per cent. pure. This product also has the advantage of being much less hygroscopic than the fused product. The Chemical and Research Company intends soon to put this product on the market.

It will now be an important thing to keep our newly mborn industries alive after the war. In my opinion, this could be achieved, so far as the potash industry is concerned, by encouraging the production of the necessary raw materials from natural sources and from by-products (principally cement mills), by reducing manufacturing expenses through economical working methods and by obtaining an adequate tariff.

Aniline Dye Trade in Foochow District Shows Decline in 1917.

Importations of foreign anilins dyes into Foochow district in a normal year total $38,000 in value. Purchases direct from Europe have never been made in the past, most of the local stocks being bought in Shanghai and Hongkong. The war interfered with importations from Europe, and it is only during the present year that a partial recovery in the trade has been had. The colors in best demand at present are scarlet, rose, magenta, fast red, indigo blue, azure, orange, green, violet, and black.

Aniline dyes are used in this district chiefly for dyeing cotton cloth, silk cords and paper. The scarlet color is used almost entirely in dyeing the last-named commodity. Very little silk dyeing is done locally, most of the silk imported being already dyed. The dyes sold on the market heretofore were put up in tins holding eight to twenty ounces and bottles containing two ounces.

Aniline dyes were imported during 1917 to the value of about $11,000. Several shipments to Foochow of Japanese aniline dyes in original cartons during the year met with little or no demand in the local market, the product being inferior in quality.

Licorice Root Grown in South Africa.

Licorice root is found in various parts of the Province of Cape of Good Hope, reports Consul John W. Dye, Port Elizabeth. After its introduction to that country a number farmers planted it and then probably on account of the lack of a market neglected it. Later it so spread in certain localities as to become a pest difficult to eradicate. Now, its usefulness has been recognized and the diggers pay a penny (2 cents) a pound for the privilege of digging it.

The quantity available in South Africa for export is very limited and will never seriously compete with the supplies coming from Asia Minor, Syria, and Mesopotamia, where it has grown and spread for centuries. If it were not that Asiatic supplies have largely been shut off on account of the war, it is probable that the higher cost of labor would make it unprofitable to harvest it in South Africa.

WHAT HAS BEEN ACCOMPLISHED DURING THE YEAR BY CONGRESS AND BY THE DEPARTMENTS OF THE FEDERAL GOVERNMENT

Federal Activities as Applying to Reporter Markets Unusually Important During the Year, Particularly After the Outbreak of Hostilities.

HOW BOTH CONGRESS AND DEPARTMENTS HAVE SOUGHT TO INCREASE OIL OUTPUT

General Land Leasing Bill to Be Important Factor in Future Production—Collapse of Gasoline Standardization.

DURING the year there was considerable speculation in regard to the length of time that our crude oil supply would last, and Dr. Oscar Bransky of the Standard Oil Company caused alarm at the convention of the Society of Agriculture Engineers by declaring that the supply of gasoline was nearing exhaustion. These statistics were challenged by the statisticians of the Bureau of Mines. Dr. Bransky estimated the quantity of crude oil, visible and invisible, at 7,629,000,000 barrels and that it would last 138 years longer at the rate of consumption in 1916, which was 55,000,000 barrels. The bureau, however, estimated that the gasoline supply would last only 27 years, but, by utilizing cracking processes, could be made to cover 75 years.

At the close of the year the Senate passed a general leasing bill applying to coal, oil and phosphate mining, which is now pending in the House Committee on Public Land. The House has four times passed the Ferris leasing bill, and, it is expected, will substitute this bill for the Senate bill, after which an agreement will be threshed out by conferees.

During the year there was considerable excitement over Wyoming oil lands, and the increased interest in that State in oil legislation was made evident by the active part taken in consideration of the general leasing bill by Senators from Wyoming and adjoining States.

Oil Income Tax Reductions.

The Treasury Department allowed income tax reductions by permitting persons on whose property oil and gas is produced to deduct from gross income on account of depletion such a percentage of the market value as of March, 1913, if the properties were acquired prior to that date, or of the cost of such properties acquired subsequent to that date, as the reduction and flow in production of the year, for which the return is made, is a percentage of the flow and production of the previous year.

There were petroleum developments in the West Indies during the year and some optimistic reports were received from Cuba, but at the close of 1917 there were no successes sufficiently large to make the West Indies a factor in the oil industry.

Oil Shale Development.

There was renewed interest in the development of oil shales reported by the Bureau of Mines and much speculation as to the possibility of making these oil shales of natural value in production. Extensive surveys were made and if the necessities of war and commerce are sufficiently great to warrant necessary investments it is likely that suitable quantities of oil and gasoline will be obtained.

National Petroleum Control.

Upon the outbreak of the war the need for national control of the oil industry was brought prominently to the front and Food Administrator Garfield was given power to fix the price of fuel oil and natural gas. The meaning of the word "fuel oil" has never been strictly interpreted, but those who framed the language of the bill intended that it should designate the article known to the trade strictly as fuel oil by product of refining, and not to designate all oil that may be used as fuel. In other words, it was not intended to apply to crude oil and no action was taken by the government leading to a decision on that point. While the coal industry was taken over by the government no action was taken looking to any similar control in the case of oil until at the close of the year, when it was announced that supervision would be given that industry, but that it was not anticipated that there would be any action looking to fixing the price, at least until the trade had been consulted and all interests brought into conference. In the meantime oil has been purchased for the United States and allies on a plan for a final settlement of the price by mutual agreement, which has appeared to work well.

Throughout the years, however, the Federal Trade Commission continued a survey of the field and gathered information so that intelligent action might be decided upon whenever occasion should arise.

Pooling Supply of Tankers.

During the fall of 1917 plans were matured for pooling the available supply of oil tankers owned by the United States and the Allies for service during the war. The purpose of this is to increase the supply of tankers available for caring for the needs of naval vessels. However, there has been entire harmony in the handling of the fuel oil intended for use of the United States and allied navies.

A unique feature attending the sale of Liberty Bonds has been the devotion of millions of dollars held in escrow on contracts between the oil operators and the government. About a million dollars held in that way by banks of the Middle West and the Pacific coast were used during the first year of the war to swell the available money to carry on the war.

In the summer and fall the rapid decrease in stocks of oil in California caused an outcry from oil interests in favor of opening for development government oil lands in California, and this condition in face of war necessities aided greatly in the passage of the general leasing bill by the Senate and will be an important factor in finally enacting that legislation if the Senate and House agree upon the terms of a bill.

The Senate passed a bill (S. 1546) providing that kerosene and lubricating oils made from refined products of petroleum, which will stand a fire test of not less than 300 degrees F., may be used as stores on board steamers carrying passengers under regulations to be prescribed by the Board of Supervising inspectors with the approval of the Secretary of Commerce.

Gasoline Production.

The Bureau of Mines, of the Department of the Interior, began work in the first days of the year with a view to increasing the production of gasoline and lubricating oils from crude, and their experts worked steadily on this problem throughout the year. The Bureau of Mines estimated that 75 per cent. of the crude oil of the country is wastefully used. The bureau has sought to determine the best cracking processes to increase the output of gasoline and has hoped that a kerosine carburetor may be invented to relieve these conditions. Considerable progress has been made in the development of a kerosene carburetor which is now successfully used in automobiles and trucks.

During the year the bureau has received hundreds of suggestions for the production of gasoline by cheap processes. Most of these claimed inventions have proved to be of no value whatever, but, in the hope that some device may be developed through these suggestions, the utmost encouragement has been given the inventors to send their ideas to the bureau, and all of them have received attention by experts who have worked faithfully to assist inventors to improve their processes.

Rittman Process.

The Rittman process has been thoroughly tried out and new plans for making it more efficient have been underway. Up to this time, it has not been possible for the bureau to make official announcement concerning practical results of the Rittman process worked on a commercial scale.

Petroleum and the War.

The petroleum supply during the year has proved ample to meet demands of the United States in the war. Chester, petroleum technologist of the Bureau of Mines, early in the year made a tour of the oil fields, and his prediction at that time that there would be no scarcity of pure oil has been verified.

Director Manning, of the Bureau of Mines, has given a great deal of personal attention to the oil supply and has done everything possible to encourage production.

The Pawhuska Oil and Gas Company of Pawhuska, Okla., was granted a new lease by Commissioner Cato Sells, of the Indian Office, for about 19,000 acres of gas land. This lease was for gas and provided that, if there should be a shortage, domestic consumers are to have the first right on the supply.

Bartlesville, Okla., was chosen for the location of the new petroleum experimental station for the Bureau of Mines.

The Independent Oil Men Association held the third of its zone conferences in Washington January 23-24. It had a very extended program of great interest to the oil industry and, while in session, there were many discussions for a general convention in this city to consider what action the Government might properly take in respect to the control of the oil production, but there was no such meeting as it was thought. Not until the last month of the year did Chief Fuel Administrator Garfield announce that the control made possible in the food bill to extend over the oil industry would be put into effect. At that time he made it known that this would be done through some leasing process, the full details of which have been announced. However, there has been criticism of any sich effort, because it is feared that restrictions placed upon industry may reduce the activity of wildcatters and in that way seriously hamper new oil development.

Alaskan Possibilities.

During the year the condition of the Alaska oil fields was discussed and the tying up by conservation policies of oil lands there to the detriment of the territory was criticized. The passage of the general leasing bill is expected to assist Alaska in obtaining an oil supply.

The wide field for oil sales in China received attention among exporters.

Gasoline Standardization.

The standardization of gasoline occupied the public eye during the early part of the year, and it was acclaimed all over the United States as a possible boon for automobilists. It was regarded as the means by which everyone would be assured the very greatest efficiency in gasoline power. It was started by a few automobile users in Washington and taken up by the Merchants' Association there and then passed on to the Bureau of Standards and the Bureau of Mines to be fully worked out. It had a short life. No sooner had these plans become partly matured than it was evident that a high standard for gasoline would curtail the quantity available and increase the price. For a time there was discussion along the line of making the standard as low as possible, so that gasoline from all classes of oil might be utilized under a standardization system. The entire project then became so impractical in view of the government's scientists that it was allowed to drop, and the only standardization thereafter considered was practical ones for the purchase of government supplies. Originally the plan was to establish the government's standard at a very high rate of efficiency and then to encourage its enforcement through the licensing system in every State of the Union, as it was soon realized that the enforcement of any standard by the national government would involve the employment of an enormous army of inspectors.

Gas and Flame Regiment.

The chemists of the Bureau of Mines were kept busy during the latter part of the year in experimenting for the purpose of providing for a "gas and flame" regiment as a war measure to meet the enemy on the Western front in Europe. In connection with all of the chemical work performed by the government there was prepared a census of the chemists of the country, with designation of the special qualifications of each man for particular service, and this list has been referred to freely in calling in practical experts.

Sodium hydroxide has been put to a new use, and extensive experiments by expert chemists in the government service, co-operating with several large commercial plants, have proved that this chemical is purifying bleach that renders Georgia and South Carolina kaolin adaptable for finest white pottery and tile manufacture.

A bill to regulate the preparation of viruses, serums, toxins, and analyses products in the use in the treatments of domestic animals was passed.

Tank Car Provision.

The Interstate Commerce Commission had contended that the railroads should furnish tank cars for the transportation of petroleum, but the United States Supreme Court took the opposite view, and held that tank cars were in the nature of special cars that railroads could not be forced to provide.

Casinghead gas regulations have been adopted to cover production in Indian lands, with a view to fairly fixing the royalty to be charged for such gas, which is graduated in accordance with the price of gasoline.

Mexican Oil Taxes.

There has been a great deal of discussion on the Mexican tax on petroleum, as it has been charged that pro-German influences have caused the Mexican Government to get an undue amount of profit and to hamper the operation of the Allies by fixing a high charge on oil that is exported. This has not gone beyond the stage of discussion, the Mexican Government having disavowed any such purpose. Crude petroleum output decreased during the summer, especially in the California fields, causing a great deal of anxiety on the part of the government, and of that portion of the oil industry that is particularly concerned with supplying the demands of the government, the Allies and the public. However, as in the case of the coal industry, the embarrassment experienced in obtaining oil has been the result of transportation, rather than the supply. The price of crude oil not being regulated, the oil men had a free field to operate, with good results, and the opening of the public domain for prospecting bids fair to increase the future supply. One of the fortunate conditions that has prevented any serious interference with oil transportation is the fact that such a large portion of this product is not dependent upon railroads, but flows unceasingly through a system of pipelines that deliver the oil to the Atlantic coast and to the Gulf of Mexico without hindrance from weather conditions or the congestion of competing freight.

Record-Breaking Output of Sulphuric Acid.

THE Bureau of Soils, Department of Agriculture, at the Arlington Farm laboratory, has demonstrated how a tremendous saving may be effected in sulphuric acid so as to bring the consumption within the possibilities of producing, which became a serious war problem. Experiments on a commercial scale have been made through a co-operative arrangement through a Hoboken plant, and several chemical and fertilizing concerns are seriously considering making use of the process, and one chemical concern is putting in an insulation. The importance of this process is shown by the estimate that 8,000,000 tons of sulphuric acid will be needed during the present year. A new principle of collecting the fumes in an electric precipitator in the smelting of phosphate rock for the production of sulphuric acid originated with the Bureau of Soils.

During 1916 $73,514,126 worth of sulphuric acid was produced in the United States, and only 7,000 tons of acid were imported, principally from Canada. Pyrites production amounted to 423,556 long tons.

Synthetic Ammonia.

The successful making of synthetic ammonia by the government at the soil laboratory, Department of Agriculture, is one of the achievements of the year. Germany is making thousands of tons of synthetic ammonia, but this is the first United States Government success, and it means much in munitions and in fertilizer. If the Solvay process plant at Split Rock, near Syracuse, N. Y., is taken over by the government as an auxiliary to its nitrate plant being constructed at Mussel Shoals, at Sheffield, Ala., it will be an important auxiliary to nitrogen production.

Paint and Varnish Legislation.

The Kenyon paint bill is still pending in Congress, where it has met sufficient opposition to delay its passage for over a year.

One of the interesting exhibition features held by the several scientific bureaus in Washington was a display of samples of paint tests made for all public buildings throughout the country at the solicitation of the Supervising Architect's Office of the Treasury Department. The educational work

carried on has had reference to standardizing the naval stores industry and to produce a more uniform and purer rosin.

Especial attention has been called during the year to foreign trade opportunities for American-made paints, which have been in demand to supplant German products. This demand was especially marked in Italy, Spain and Portugal. Undoubtedly had shipping facilities been better there would have been a very much greater extension of foreign trade in paints.

During the year there have been many informal conferences of large paint manufacturing concerns with the sub-Committee on Supplies of the Council of National Defense, with a view to bringing about greater economies in the paint trade.

Unfair Competition.

The Federal Trade Commission has taken a prominent part in eliminating various forms of unfair competition in the paint trade. The commission has received a great many complaints of various devices for cutting prices. In all such cases the party complaining has been protected by having such correspondence held as confidential, and the commission on its own volition has called upon the dealers who have been accused of these unfair methods for explanation. The commission has been astonished to find that the very men who have pursued these unfair practices have been most ready to eliminate them, provided they could be given some assurance that in turn they would be protected from unfair competition on the part of others. So it has been that by a mere process of friendly co-operation conditions in the paint trade have been very greatly improved.

Opportunities Elsewhere.

Investigations carried on by the Bureau of Foreign and Domestic Commerce in respect to opportunities for paint manufacturers in China, Japan, Chile and Peru, and, in fact, throughout South America, have been extremely encouraging. And it is believed that once shipping facilities are obtained there will be a practical result from these investigations regular to the benefit of the United States.

Conservation of Tin.

During the year the war service committees of the paint and varnish trade have planned to obtain statistics on production and consumption of all paints and varnishes, and also in respect to containers, with the idea of conserving the supply of tin. The advantages of these conferences, doubtless, will be realized during the coming year.

Naval Stores.

There was a great deal of activity among turpentine and rosin producers for an intensive development of naval stores products, which received encouragement and support of the government through the Bureau of Chemistry of the Department of Agriculture. The bureau gave the organization formed for this purpose, and known as the Turpentine and Rosin Producers' Association, its "best" man upon turpentine and rosin production. C. F. Speh, who did considerable research laboratory and field work for the Bureau of Chemistry, with particular reference to naval stores, resigned from the government service to take charge of this trade organization. The important object of the association is to increase the production of naval stores, and the result of their efforts soon will be known and will be of the greatest interest to the trade.

The Bureau of Chemistry, Department of Agriculture, has done a great deal of work on standard types and on procedure for turpentine grading which has proved of great value to the trade. Four standard types will be found—water white, standard, one shade and two shades. Up to the time of taking this action there had been no standard.

Dr. F. P. Veach, in charge of the naval stores activities of the Bureau of Chemistry, has devoted his attention during the year to plans for improving the quality as well as the quantity of naval stores.

New Turpentine Source.

During the year Federal investigators discovered a new source of turpentine supply as a by-product in the manufacture of wood pulp, this product being odorless. This odorless turpentine was discovered by Frederick W. Kressman, a chemist of the forest products laboratory at Madison, Wis.

During the year it was planned to obtain the passage by the present Congress of a bill looking to the prevention of adulteration of turpentine and misgrading of rosin and the ultimate standardization of both products.

Replanting Pine Lands.

The forest service of the United States Department of Agriculture had been vigorously promoting a plan to perpetuate the naval stores industry through the restocking of depleted Southern pine lands. It has been found that slash pine is fast replacing long-leaf pine in many sections of the South. Its growth is more rapid and its yield of turpentine larger than the long-leaf pine, Federal experts say. It can withstand the combination of forest fires and razor-back hogs better than the long-leaf pine. Forest reservists officials say that in one instance in South Carolina a 20-year-old stand of slash pine averaged 520 trees to an acre, each one of which had one cup for which the turpentine operator paid the owner 10 cents a cup, or $52 an acre for the privilege of tapping trees. After a rest of from three to five years it has been pointed out these trees are in good condition for back-cupping and should produce larger financial returns.

Federal Protection Asked.

There was considerable effort made to induce the War Industry Board of the Council of National Defense to provide for Federal protection for the naval stores industry. Legislative action has been urged to protect the production of high grade rosin and turpentine through prohibition of adulteration. The Turpentine and Rosin Association has used its influence to advance this legislation during the present session. Special support is being given these efforts because the War Industry Board of the Council of National Defense has obtained statistics showing that turpentine exports from the United States have fallen off to an alarming extent during the war. The falling off in the price of turpentine has been partially charged to practices of adulteration which it is hoped by legislation to avoid.

The government has made some progress in investigations for the use of pure turpentine in the manufacture of gunpowder. It is stated that turpentine is being so used by some of the Allies and by Germany and Austria. This has been done by making synthetic camphor, and, in turn, camphor is used in making powder.

The trade has shown its interest in promoting Federal inspection of all naval stores moving in interstate commerce and in Federal supervision of the entire trade. This proposed legislation is still pending.

GROWTH OF DYE INDUSTRY SINCE GERMAN PRODUCTS WERE CUT OFF BECAUSE OF WAR

PERHAPS the greatest improvement in American manufacturing methods that has taken place during the war has been connected with the dye industry. When the war opened the United States was face to face with the humiliating condition that we were depending on Germany for dyes with which to print our money and all classes of securities. When the war broke out there was a considerable stock of German dyes on hand, but Director Ralph of the Bureau of Engraving and Printing at once got in touch with the dye makers of this country with the object of providing a satisfactory supply as soon as the stock of German dyes should be used up. At the present time the Bureau of Engraving and Printing is running on American dyes, and of necessity will have to do so until the conclusion of the war. At this time it is confidently believed that American dyes will be equal in quality to any of the German colors. In fact, in a very large number of colors this is now the case and improvements are constantly being made.

The dye industry has also fulfilled the requirements of trade, so that American manufacturers have not suffered nearly so much in quality of dyes needed as was feared at the beginning of the war. The dye industry has been established in America to stay, so far as quality is concerned, and if proper protection is provided for the industry against the cheaper German products after the war the manufacturers of the United States will be upon a solid basis of prosperity.

Federal Co-operation.

In the improvement of the dye industry the Bureau of Chemistry has co-operated as far as has been possible with a small appropriation for that purpose. The bureau has carried on its investigation in its laboratory it has equipped near Fort Myer, Virginia, this investigation looking toward the promotion of production of dyestuffs, both from the natural plant growths and from the coal-tar products. This is the first effort of the Federal Government toward the development of a great industry. It has been pointed out that in Germany, where the dye industry has become a great national institution, it has been built up by government patronage, co-operation, research work and subsidy. It is to be seen whether Congress will be wise enough to continue these efforts.

It has been hoped that the Bureau of Chemistry by this means would assist manufacturers in determining the styles, types and materials of construction of apparatus for various processes. If this is done and American manufacturers are provided with the type of machinery necessary, the establishment of additional dye industries will always be easily accomplished.

The dye industry has a particularly hopeful prospect in the United States because the products of coal-tar industries that are now being used in war activities will upon a return of peace be available for the manufacture of dyes. In this war all the machinery for an extensive industry to supply not only the United States but the entire world if need be will be available.

Now 158 Manufacturers.

The extent of the growth of the dye industry is readily seen by the classification by the government of 158 manufacturers against seven dye manufacturers in 1914. Many of these manufacturers are producing on an enormous scale and will be prepared after the war to meet all demands. In the meantime the reputation of American dyes is constantly growing, so that "Made in Germany" will not be deemed necessary to insure high quality. For a considerable time it was believed that the dye industry would be hampered by the fact that all patents taken out by enemy aliens would not be available for use here, but legislation by Congress has corrected that difficulty and to a considerable extent American manufacturers are placed on an equality with their former German competitors.

After the war it has been planned that the color makers of France will take over the munition plants to manufacture dyes on a large scale.

It became necessary for Director Statton of the Bureau of Standards to explain to the trade that the work of his department has been to standardize color and not dyes.

FEDERAL ACTION AS TO CONTROL OF THE PRODUCTION OF DISTILLED SPIRITS

THE standardization of drugs was discussed freely during the year and considerable opposition was developed to any plan for placing the standardization of drugs in the hands of any one man or even one bureau. Perhaps the most important legislation of the year in respect to the drug trade was that relating to distilled spirits. This resulted in the placing of heavy restrictions to prevent abuses leading to the use of such distilled spirits in the manufacture of drugs, and the war revenue bill carried a great deal of legislation which has done much to hamper the operations of proprietary medicine enterprises. It has also made war upon so-called medicinal products that have been chiefly valued for the alcoholic content, and in doing so has conferred a benefit upon the trade generally.

Another interesting development has been the encouragement given to the production of native drug plants. In Florida the production of gum camphor has been placed upon what is believed to be a permanent foundation. The greatest obstacle in the way of producing medicinals has been the scarcity and the high cost of labor in the United States. However, with the settling down of the country to a peace basis the experimental work and investigation that has been carried on cannot fail to produce results of permanent importance.

At the North Carolina Experimental Farm which has grown pepper and cannabis indica commercially, experiments have been carried on for testing sunflower seeds for oil purposes.

Adoption of Metric System Urged.

The Bureau of Standards has favored the metric system and will adopt it exclusively as soon as it is consistent with public service. Undoubtedly in the entrance into foreign trade the adoption of this system in many lines of drugs and chemicals will result in an advantage to exporters.

There was considerable anxiety after the war began over reports that court plaster was being put upon the market containing deadly germs and some of the analyses of these plasters showed tetanus germs present. This led to measures of precaution in respect to the origin of such plasters in order to assure entire protection from any alien conspiracy.

The rich field for the proprietary medicine trade offered by China has been pointed out during the year and methods for reaching this trade have been investigated and explained to American manufacturers of drugs.

The trade in habit-forming drugs has shown to be alarming and discussions as to necessary legislation are still going on with a view to perfecting the law for the control of interstate shipments.

The officials of the government have found it necessary to be especially active in watching importation of drugs to prevent substitutes from being thrown upon the market. This has been partly due to the prevailing high prices.

In the passage of what is known popularity as the salvarsan bill the right to manufacture many drugs heretofore monopolized by German manufacturers has been facilitated.

Commissioner Roper of the bureau has permitted the use of formula 2f in the manufacture of a 4 per cent. tincture of iodine, without the addition of potassium.

Enemy Patent Licenses.

In the latter part of December the Federal Trade Commission granted to three American firms licenses to manufacture and sell drugs which heretofore have been controlled by alien enemies under American patents. One of these is to be known as "Barbitil." The old name of this drug was varinol. Another drug is hereafter to be known as "Pro-Caine." It has largely supplanted the use of cocaine.

Fraudulent advertising was put under a ban in many places. In the District of Columbia the law in relation to truthfulness in advertisements was strictly enforced and wherever there have been false or misleading claims, such as alleged cures for consumption, Bright's disease, diebetes, appendicitis, etc., a change in the wording of the advertisement has been enforced.

During the summer there was an enormous drain on the drug market resulting from large purchases by the United States Government of standard packages which were stored in a special building in Washington.

HOW THE GOVERNMENT MET THE NITRATE PROBLEM—THE SEARCH FOR POTASH

THE fertilizer problem became prominent soon after the breaking out of hostilities on the part of the United States. The restrictions upon shipping and the reduction in the Chilean supply of potash led to discussions of measures to place this valuable commodity upon the market at a low cost, and efforts for that purpose are still being made.

In order to obtain a good supply of nitrates, Congress has appropriated largely for a nitrate plant for the fixation of nitrate. One of the measures resorted to has favored the full loading of cars holding fertilizer. Within a year, it is expected, the $20,000,000 nitrate plant at Muscle Shoals will be in operation.

One of the regrettable incidents of war preparations was developed in the making of potassium bichromate, the American article causing primers to hang fire. Formerly the potassium bichromate used in the manufacture of those primers came from Germany and the chemical did not contain any potassium bromate. Its presence in the American article was not suspected, but it facilitated the formation of sulphuric acid after the cartridges had remained in storage and this caused a hang fire. All the ammunition made from this faulty decimal was recalled and a valuable lesson was learned by the American manufacturers.

Potash From Kelp.

The manufacture of potash from kelp has been started in a Federal Government plant at Summerland, Cal. The kelp is run through driers and finally reduced to char containing all the potash salts. How to save potash that is now being dissipated in the air as an absolute by-product in a quantity sufficient to exceed all the demands in this country has been the subject of a thorough study by the Bureau of Soils, Department of Agriculture, and the Bureau of Mines, Department of the Interior.

It has been demonstrated that a by-product process saves from 16 to 22 pounds of potash to each ton of pig-iron produced by blast furnaces. An important addition to the potash supply of the U. S. comes with the development of a new field of production at Searles Lake in the extreme northwest section of San Bernardo county, California. Large quantities of muriate of potash, 80 per cent. or better pure potash, have been developed.

After a survey and census of the cement mills of the country the Bureau of Soils, found that much potash would be conserved by the proper operation of cement and blast furnace plants. It is claimed that an electrical precipator, such as the Cottrell method, will collect more than 90 per cent. of the potash that goes up in smoke. Efforts to introduce this form of conservation have been made throughout the year.

Potash Land Permits.

The government has issued permits to develop the potash lands of the country and during the next year it is expected that there will be large returns from this source. These permits cover 2,560 acres or less and if the permittee discovers potash in commercial quality and quantity he will be entitled to a patent for one-fourth of the area of his permit, the remainder to be subject to lease by the government.

This legislation was brought about by a special bill, provisions for potassium leasing having been taken out of

the general leasing bill relating to coal, oil and natural gas and passed by Congress as a war measure.

It has been estimated that the 1917 production of potash has been doubled over that of 1916.

OIL PRODUCTION FOSTERED BY FEDERAL AUTHORITIES A WAR-TIME ESSENTIAL

THE Hoover Food Administration sought to develop the cottonseed oil crop by every means possible. To check hoarding of cottonseed and cottonseed products the Food Administration issued regulations to prevent hoarding and crushers of cottonseed were not permitted to have on hand or under contract any greater quantity of cottonseed than their normal crush for 60 days, nor to hold any cottonseed longer than 60 days during the period of actual operation of the mill.

The possibility of cultivating the wood oil tree in the United States has received a great deal of attention, and an effort has been made to introduce it in the States in which the Chinese tree can best be cultivated. It was shown to grow and fruit well in South Carolina, Florida, Alabama, Louisiana, Mississippi, Georgia, Texas and California.

Edible Oil.

The demand for oil suitable for salad dressings and general food purposes has increased so rapidly that the Department of Agriculture has given the time of many of its experts to develop additional supply. Cottonseed, cocoanut and peanut oils have been developed and corn oil has appeared in the retail markets. Many other oils, it is believed, can be used in addition to these products, and it has been the aim of the department within the last year to perfect experiments to fill these needs.

The demand of the war has increased the interest in vegetable fats, not only for explosives, but for plants, varnishes, lubricants and for edible purposes as well as for medicine and for use by soap manufacturers.

Oil from tomatoes, to be made up of refuse about canneries, was made the subject of a special bulletin issued under the direction of Dr. W. W. Stockberger.

It has also been pointed out during the year that poppy, sesame and sunflower oils as vegetable fats have not yet been developed.

Castor Oil Production.

The development of the Liberty motor for aeroplanes has been one of the most interesting of all government activities, and this has made necessary measures looking for a large supply of castor oil, which is the most perfect lubricant for the motor. The visible supply of castor oil being wholly inadequate, the Department of Agriculture has taken the unusual method of contracting for the planting of about one hundred thousand acres in castor oil plants, from which, it is believed, there will be an enormous supply. This has been done by contracting with the planters to take all the oil the latter can produce on a given number of acres at a fixed price of $3.50 per bushel for the seed. This may appear to be a large price, but when it is considered that corn and wheat are bringing high prices, it is necessary to give an inducement for the planting of castor oil plants.

The Liberty motor has also set to work a large number of xpert chemists to develop the most superior motor fuel ever known, and it is expected that this fuel will play an important part in the efficiency of the American aeroplane in the war.

Efforts have been made by the government to interest the Eastern oil manufacturers in the production of a valuable oil from sunflower seed, which has proved adaptable as a substitute for linseed oil.

MISCELLANEOUS ACTIVITIES DURING YEAR JUST CLOSED AMONG MANY ALLIED LINES

THE activities of the War Board in respect to exports and imports has been of the greatest interest to all of the Reporter trades, which have had to accept the disadvantages of these prohibitions as one of their contributions toward war success. Regulations in respect to hundreds of articles that have been exported have been changed from time to time with the idea of permitting nothing to reach the enemy through any channel.

The United States Tariff Commission in the latter part of the year drafted a Schedule "A" of the tariff act, which deals with chemicals, oils and paints. Blanks were sent to chemical manufacturers and special agents were sent out. A report of this commission to Congress will be made.

The United States Bureau of Chemistry has placed its analytical laboratories and its force of trained workers at the disposal of the food division organized by the Surgeon-General of the army. The purpose of which is to determine just what diet will keep the soldier at his most efficient physical condition and to adopt a standard ration for the United States army. These problems have gone a long way toward being solved in a way satisfactory to the government, but additional study will be given this subject.

Control of Exports.

Export control by the government for the purposes of the war interfered somewhat with some industries, but in most cases the demand has been so great that it has not been a serious hardship.

The Federal Trade Commission, being given power to control trading associations in foreign business, is in a position and undoubtedly will do much to assist foreign trade when the war ceases. This control will permit the making of combinations by exporters, which will be of an immense advantage in advertising deliveries and collections.

In October the government commandeered thousands of tons of caustic soda for the war, and there have been numerous reports of similar action in relation to other chemicals, many of which have been without foundation.

To check the smuggling of opium, it is probable that Congress will enact some drastic legislation with penalties, including fines and imprisonment, such as are provided in the Phelan measure, to perfect the Harrison law.

Tinplate Conservation.

The necessity for containers has somewhat hampered the operations of all of the Reporter trades. The scarcity of food has been the chief source of difficulty, and paper and other containers have been substituted in many instances. The government is so carefully guarding this question that the exportation of containers and of tin is not only restricted, but in some instances, when there is no embargo on the exportation of products put up in tin, a license may be required for the tin containers, and it will be denied if some other kind of container can practically be used. This has done a great deal to assist the situation.

During October the release of any goods so that purchases made prior to the war might be shipped to American buyers proved a great assistance in many lines of industry, and markedly so in the case of drugs and chemicals.

The government has also moved toward an analysis of city waste to promote economy, and has sought, as is done abroad, to conserve the waste ordinarily thrown away in the garbage. Investigation by the Food Administration shows more than 29 per cent. saving in garbage grease in nine of the largest cities of the country, and there also has been vast savings from army camps.

Curtailment of Paint Shades.

Careful investigation of the paint and varnish manufacturing industry looking to the curtailment of shades, finishes and grades as a war measure has been undertaken by the commercial economy board of the Council of National Defense, which has sought to learn from each paint and varnish manufacturer whether as a war-time efficiency it is practical to reduce the number of these shades, finishes and gradings, and to what extent it can be done to conserve men, money and materials for the war. The drain on the drug resources of the country by the war has been enormous, and the same is true in the case of surgical dressings.

Congress early in the year passed the Reed amendment to the postoffice appropriation bill allowing the sale and shipment of alcoholic liquors for medicinal, sacramental, scientific and mechanical purposes to prohibition States. The postoffice bill contained a drastic provision prohibiting the transmission through the mails of advertisements or newspapers containing advertisements of spirituous, vinous, malted, fermented or other intoxicating liquors of any kind, or a solicitation of an order for such liquors into dry territory, and that provisions have been strictly enforced by the Postoffice Department.

Protecting Crops.

Because of a serious shortage and high prices for insecticides and fungicides grave concern is felt by government officials and by trade organizations that there will be a serious destruction of truck and fruit crops next season, particularly the potato crop. In some sections extensive spraying operations have had to be abandoned, and there is even worse conditions for the spring crops. The Bureau of Plant Industry, Department of Agriculture, and the Bureau of Chemistry are making a thorough investigation of this subject and intend to do all in their power to safeguard the truck and fruit crop. Shortage and high prices for arsenic, parisgreen and other insecticides and fungicides make spraying almost prohibited. "The bureas in conjunction with the Bureau of Mines, Interior Department, have been seeking to determine how much the high prices have been justified. Natural conditions, it is acknowledged, have caused the shortage, one of which has been the demand for copper for the war. The government will co-operate to provide the largest possible supply of spraying ingredients.

LIST OF COMMODITIES REQUIRING EXPORT LICENSED AS ISSUED BY U. S. GOVERMENT

Special List Compiled Covering Goods Sent to Canada—Complete List of Licensed Commodities in Reporter Markets.

Completing the list of export articles for which a shipping license is required, the War Trade Board has made public a complete specification as to requirements for foreign trade, a new application form having been substituted on February 1, 1918, for that hitherto employed.

All articles of commerce require a license when shipped to Alabania, Austria-Hungary, that portion of Belgium occupied by the military forces of Germany, Bulgaria, Denmark, her colonies, possessions, or protectorates, Greece, Leichtenstein, Luxembourg, the Kingdom of the Netherlands, Norway, Spain, her colonies, possessions or protectorates, Sweden, Switzerland, or Turkey (excluding any portion of the foregoing occupied by the military forces of the United States or the nations associated with the United States in the war), or any territory occupied by the military forces of Germany or her allies.

The list of commodities herewith require export licenses for shipment to Abyssinia, Afghanistan, Argentina, that portion of Belgium not occupied by the military forces of Germany or the colonies, possessions, or protectorates of Belgium, Bolivia, Brazil, China, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Egypt, France her colonies, possessions or protectorates, Guatemala, Haiti, Honduras, Italy, her colonies, possessions or protectorates, Great Britain, her colonies, possessions or protectorates, Japan, Liberia, Mexico, Monaco, Montenegro, Morocco, Nepal, Nicaragua, the colonies, possessions, or protectorates of the Netherlands, Oman, Panama, Paraguay, Persia, Peru, Portugal, her colonies, possessions or protectorates, Roumania, Russia, Salvador, San Marino, Servia, Siam, Uruguay, Venezuela (excluding any portion of the foregoing occupied by the military forces of Germany or her allies), or any territory occupied by the military forces of the United States or by the nations associated with the United States in the war.

Those commodities in front of which a star (*) appears require individual licenses when shipped into Canada. All other commodities on this list when shipped to Canada do not require individual licenses.

The detailed list:—

A

Abrasives, all.
*Abrasives, emery, X-2.
Acetanilide.
*Acetate of cellulose and all acetates, X-2.
*Acetic acid, X-2.
*Acetic acid, glacial, X-2.
Acetic anhydride.
*Acetone, X-2.
*Acid, carbolic (phenol), X-2.
*Acid—
*Acetic, X-2.
*Glacial acetic, X-2.
Hydrofluoric.
*Phosphoric, X-2.
*Stearic, X-1.
*Nitric, X-2.
*Sulphuric, X-2.
*Acid phosphate, X-2.
*Alcohol.
*Alcohol, wood, X-2.
*Alum, X-2.
*Alum, chrome, X-2.
*Alum, potash, X-2.
*Alumina, sulphate of, X-2.
*Aluminum.
*Aluminum, articles made entirely thereof.
Aluminum, articles containing.
*Alundum grain, X-2.
*Alundum wheels, X-2.
Amidoazobenzol.
Amidophenol.
(Paraamidophenol.)
*Ammonia and its salts.
*Ammonia, anhydrous, X-2.
*Ammonium nitrate, X-2.
*Ammonium sulphate, X-2.
*Ammonium chloride, X-2.
*Ammonium bromide, X-2.
*Ammonium carbonate, X-2.
*Ammunitions, X-2.
*Amorphous phosphorus, X-2.
*Anhydrous ammonia, X-2.
Aniline oil.
Aniline salts.
*Animal fats, X-1.
*Animal oils, X-1.
*Antimony.
Antimony, black.
Antimony—
*Sulphate of, X-2.
*Sulphide of, X-2.
*Antimony ore.
X-ray.
*Arsenate of lead, X-2.
*Arsenate of soda, X-2.
*Arsenic and compounds thereof, X-2.
*Asbestos, X-2.
*Ash, wood, X-2.
*Ash, soda.
*Ashes, hardwood.
Auto grease.

B

*Bags, jute, X-2.
*Balata, X-2.
Balls, naphthaline.
*Barium—
Nitrate of.
Sulphate of.
*Beans, castor, X-2.
*Benzaldehyde, X-2.
Benzene.
Benzine.
Benzine oil.
Benzol and its derivatives.
Beta-naphthol.
*Bichromate of potash, X-2.
*Bichromate of soda, X-2.
*Bismuth salts.
*Bisulphite, sodium.
Black antimony.
*Blancfixe (sulphate of barium), X-2.
Bleached soda pulp.
*Blood, dried, X-2.
*Bluestone (copper sulphate), X-2.
*Blue vitriol, X-2.
*Bone flour.
*Bone, ground.
*Bone meal.
*Bromide ammonium, X-2.
*Bromide potassium, X-2.
Bunkers.
*Butter, substitutes, X-1.
*Butter, peanut, X-1.
*Button lac, X-2.

C

*Calcium nitrate, X-2.
Candles, paraffin.
*Candles, stearic acid, X-1.
*Candles, tallow, X-1.
*Carbolic acid (phenol), X-2.
Carborundum.
*Carbonate of ammonium, X-2.
*Casings, oil well.
*Castor beans, X-2.
*Castor oil, X-2.
*Castor oil, sulphurated, X-2.
*Cattle manure.
*Caustic potash, X-2.
*Caustic soda, X-2.
Cellulose.
*Cellulose, acetate of, X-2.
*Chestnut extracts, X-2.
*China wood oil, X-2.
*Chloride of ammonium, X-2.
*Chlorate of potash, X-2.
*Chlorate of sodium, X-2.
*Chlorates, all other.
Chlorbenzol (monochlorbenzol).
*Chrome alum, X-2.
*Cinchona bark.
*Citrate, potassium, X-2.
*Cobalt—
Ore, and
Any metal or ferroalloy thereof, X-2.
*Cobalt, chemical compounds thereof, X-2.
Coconut, desiccated.
*Coconut oil, X-1.
*Codliver oil.
Coins, mineral.
*Cooking fats, X-1.
*Copper, chemical compounds thereof, X-2.
*Copper sulphate, X-2.
*Copra, X-1.
*Corn oil, X-1.
*Corundum wheels and stones.
*Cotton linters, X-2.
*Cottonseed, X-1.
*Cottonseed meal, X-1.
*Cottonseed cake, X-1.
*Cottonseed oil, X-1.
Cresols.
*Crucibles.
Crude turpentine.
*Cyanamide, X-2.
*Cyanide of sodium, X-2.
*Cyanides (all), X-2.
*Cylinder oil.

D

Desiccated coconut.
Dextrine.
Dimethylaniline.
Dinitrobenzol.
(Metadinitrobenzol.)
Dinitrochlorbenzol.
Dinitrophenol.
Diphenylamine.
*Dried blood, X-2.

PRESIDENT TAKES CONTROL OF ALL IMPORTS AND EXPORTS.

Effective on February 16, by proclamation, the President subjected to Federal control the entire foreign commerce of the United States, thus affecting other articles in foreign trade not specified by the existing license lists published in the article herewith. The shipping situation and the demand upon every ton of shipping available made necessary this radical step. The proclamation does not mean an embargo on commodity movement, but places in the hands of the President the power to regulate which will be exercised through the War Trade Board and the Treasury Department. The single purpose will be the winning of the war.

All licenses for import and export will as heretofore be issued by the Treasury Department and the War Trade Board.

E

*Edible grease of animal or vegetable origin, X-1.
Epsom salts.
Ether.
*Ethylmethyl ketone, X-2.

F

*Fats, animal, X-1.
*Fats, cooking, X-1.
*Fats, all other, X-1.
*Feeds and fodder, X-1.
*Ferric alum.
*Ferrochrome, X-2.
*Ferrocobalt, X-2.
*Ferrocyanide potash.
*Ferromanganese, X-2.
*Ferromolybdenum, X-2.
*Ferronickel, X-2.
*Ferrosilicon X-2.
*Ferrotitanium, X-2.
*Ferrotungsten, X-2.
*Ferrovanadium, X-2.
*Fertilizers, including—
*Acid phosphate, X-2.
*Ammonium sulphate, X-2.
*Bone flour.
*Bone meal.
*Cattle and sheep manure.
*Cyanamide.
*Dried blood.
*Ground bone.
*Guano.
*Hardwood ashes.
*Humus.
*Land plaster.
*Nitrate of soda, X-2.
*Phosphate rock.
*Potash.
*Potassium salts, X-2.
*Potato manure.
*Poudrette.
*Soot.
*Superphosphate, X-2.
*Flake graphite, X-2.
*Flaxseed, X-1.
Fluoride, sodium,.
*Fodder and feeds, X-1.
*Fodder hulls, X-1.
*Food grains, X-1, including, among others, barley, rice, oats, rye, wheat, and flour and meal therefrom, X-1.
*Fodder, X-1.
*Fuel oils.

G

Gasoline.
*Gauze (hospital), X-2.
*Glacial acetic acid, X-2.
Glauber salts.
*Glucose, X-1.
*Glycerin, X-2.
*Graphite, X-2.
Grease, auto.
*Grease of animal or vegetable origin (edible or inedible), X-1.
*Ground bone.
*Guano.
*Gum lac, X-2.
*Gum opium.
*Gutta-joolatong, X-2.
*Gutta-percha, X-2.
*Gutta-siak, X-2.

H

*Hand lantern, oil.
*Hoof oil, X-1.
Hydrofluoric acid.

I

Implements, drilling, and machinery accessories for oil wells.
*Inedible grease, X-1.

J

Jelly, petroleum.
*Jute and products (including cloth bags, gunnies, twine, etc.), X 2.

K

Kerosene.

L

*Land plaster.
*Lantern oil.
*Lard, X-1.
*Lard compound or lard substitutes, X-1.
Lead.
*Lead, arsentate of, X-2.
Lead, white (dry).
Lenses, optical.
Linseed.
*Linseed oil, X-2.
*Linters, cotton, X-2.
Lubricants.

M

*Magnesium, sulphate, X-2.
*Manganese, chemical compounds thereof, X-2.
*Manganese oxide, X-2.
*Manure—
*Cattle.
*Potato.
*Sheep.
*Meal—
*Bone.
*Corn, X-1.
*Cottonseed, X-1.
*Oil cake, X-1.
Meats and fats, including—
*Copra, X-1.
*Corn oil, X-1.
*Cottonseed oil, X-1.
Desiccated coconut.
*Grease, edible or inedible, of animal or vegetable origin, X-1.
*Lard, X-1.
*Linseed oil, X-1.
*Peanut butter, X-1.
*Peanut oil, X-1.
*Rapeseed oil, X-1.
*Stearic acid, X-1.
*Tallow, X-1.
*Tallow candles, X-1.
*Mercury and its salts, X-2.
*Methylethyl ketone, X-2.
*Mineral oil.
*Mineral-oil colza.
*Molybdenite, X-2.
*Molybdenum, X-2.
*Molybdenum, chemical compounds thereof, X-2.

N

Naphtha.
Naphtha oil.
Naphthalene.
Naphthalene balls.
*Neatsfoot oil, X-2.
*Nickel, chemical compounds thereof.
*Nitrate of ammonia, X-2.
*Nitrate of barium.
*Nitrate of calcium, X-2.
*Nitrate of potash, X-2.
*Nitrate of silver.
*Nitrate of soda, X-2.
*Nitric acid and its salts, X-2.
*Nitroacetanilide.
(Paranitroacetanilide.)
*Nitroaniline.
*Nitrobenzol, X-2.
*Nitrochlorbenzol.
(Paranitrochlorbenzol.)
*Nitrocresols.
*Nitronaphthalenes, X-2.
*Nitrophenol, X-2.
(Paranitrophenol.)
*Nitrotoluol, X-2.
(Orthonitrotoluol.)
(Paranitrotoluol.)
*Nitroxylols.
*Nitrosodimenthylaniline.

O

Oils, including—
Aniline.
*Animal, X-1.
Benzine.
*Castor, X-2.
*Castor, sulphurated, X-2.
*China wood, X-2.
*Cod liver, X-2.
*Corn, X-1.
*Cottonseed, X-1.
*Cylinder.
*Fuel.
*Gasoline.
*Hand lantern.
*Hoof, X-1.
*Kerosene.
*Lantern.
*Linseed, X-2.
*Lubricating.
*Mineral.
Naphtha.
*Neatsfoot, X-2.
*Oleo, X-1.
*Palm, X-1.
*Paraffin.
*Peanut, X-1.
*Rapeseed, X-1.
Red.
*Vegetable, X-1.
*Oil cake, X-1.
*Oil cake meal, X-1.
*Oleo oil, X-1.
*Oleomargarine, X-1.
*Oil well casings.
Oil well drilling implements and machinery and accessories.
*Opium, gum.
Optical glass.

P

*Palm oil, X-1.
Paraffin—
Candles.
Oil.
Wax.
Paranitraniline, X-2.
Peanuts.
*Peanut meal, X-1.
*Peanut oil, X-1.
Petrolatum.
*Petroleum.
Petroleum jelly.
*Phenol (carbolic acid) and its derivatives, X-2.
*Phenolphthalein, X-2.
Phosphate—
Rock.
Sodium.
*Super, X-2.
*Phosphoric acid, X-2.
*Phosphorized 5 per cent. tin, X-4.
*Phosphorus, X-2
*Phosphorus, amorphous, X-2.
*Phosphorus, yellow, X-2.
Plaster, land.
*Plumbago (graphite, imported and unmanufactured), X-2.
*Potash, X-2.
*Potash alum, X-2.
*Potash—
*Bichromate of, X-2.
*Caustic, X-2.
*Chlorate of, X-2.
*Nitrate of, X-2.
*All other potash salts, X-2.
*Potassium bromide, X-2.
*Potassium chlorate, X-2.
*Potassium citrate, X-2.
*Potassium permanganate, X-2.
*Potassium salts, X-2.
*Potato manure.
*Poudrette.
*Powder, soap.
*Powdered milk, X-1.
Prussiate of soda.

Q

*Quebracho extract, X-2.
*Quicksilver, X-2.
*Quinine, sulphate of, X-2.

R

*Rapeseed oil, X-1.
Red oil.
Rock phosphate.
Rosin.
Rosin oil.

S

Saccharin.
*Sal ammoniac, X-2.
*Saltpeter, X-2.
Salts—
*Ammonia.
Aniline.
*Bismuth.
Epsom.
Glauber.
*Nitric.
*Potassium, X-2.
*Seedlac, X-2.
*Sheelite, X-2.
*Sheep manure.
*Shellac, X-2.
*Silver nitrate.
*Soap, X-1.
*Soap powder.
*Soda ash, X-2.
Soda—
*Aresenate of, X-2.
*Bichromate of.
*Caustic, X-2.
*Nitrate of, X-2.
Pulp, bleached.
Prussiate of.
Sulphate of.
*Sodium.
*Sodium benzoate, X-2.
Sodium bisulphate.
*Sodium, cyanide, X-2.
Sodium fluoride.
Sodium phosphate.
Sodium sulphite, X-2.
*Soya bean meal, X-1.
*Soya bean oil, X-1.
Spelter.
Sponges.
*Starch, X-1.
*Stearine, X-1.
*Stearic acid, X-1.
*Stearic acid candles, X-1.
*Strontium ores, X-2.
Sugar of milk.
*Sulphate—
*Copper, X-2.
*Zinc.
*Sulphate of alumina, X-2.
*Sulphate of ammonia, X-2.
*Sulphate of antimony.
Sulphate of barium.
Sulphate of iron.
Sulphate of magnesium.
*Sulphate of quinine, X-2.
Sulphate of soda.
*Sulphide of antimony (stibnite).
*Sulphite sodium, X-2.
*Sulphur, X-2.
*Sulphurated castor oil.
*Sulphuric acid, X-2.
*Superphosphate, X-2.

T

*Tallow, X-1.
*Tallow candles, X-1.
Tetranitroaniline.
Tetranitroethylaniline.
Tetranitromethylaniline.
*Tin, all articles containing, X-4.
*Tin and any metallic alloy containing tin, X-4.
*Chloride of tin, X-4.
*Tin boxes, except when used as food containers, X-4.
*Tin canisters, except when used as food containers, X-4.
*Tin foil, X-4.
*Tin ore, X-4.
*Tin tetrachloride, X-4.
*Tin, phosphorized 5 per cent., X-4.
*Tin plate, X-4.
*Terne plate, X-4.
*Tolidin, X-2.
*Toluidine, X-2.
(Orthotoluidine.)
(Paratoluidine.)
*Toluol, X-2.
*Toluol derivatives, X-2.
*Trinitrotoluol, X-2.
*Tungsten, any chemical compound thereof, X-2.
Turpentine.
Turpentine, crude.

V

*Vanadium, X-2.
Vaseline.
*Vegetable oil, X-1.
*Vitriol, blue, X-2.

W

Wax, paraffin.
White lead (dry).
White zinc (dry).
*Wolframite, X-2.
*Wood alcohol, X-2.

X

Xylidine.
Xylol.

Y

*Yellow phosphorus, X-2.

Z

Zinc.
Zinc sulphate.
Zinc, white (dry).

One application form, designated as Form X, is hereafter to be used for all export licenses, with supplementary forms for certain articles as shown on the following list. The designations X-1, X-2, X-3, X-4, and X-5 following the names of the commodity on the list herewith indicate that the supplementary information sheet bearing that number must be filled out and pasted on the back of Application Form X. Where no designation follows the word, Application Form X alone must be used.

ZINC RECOVERED DURING 1917 DECREASED FROM 702,610-TON TOTAL MINED IN 1916

Permanent Loss Involves Net Reduction of 50,000 Tons a Year of Recoverable Zinc—40 Per Cent. of Retorts Idle.

THE zinc-mining and zinc-smelting industries started the year with every prospect of prosperity, although the price of spelter was below the average of the preceding year. During the last half of the year both the zinc smelters and the zinc miners were claiming that their operations were unprofitable because of the high general prices and the low price of specter. In consequence a large part of the smelting capacity of the country was idle at the close of the year and there was a notable curtailment of output during the last quarter.

According to the best information now available, the recoverable zinc content of ore mined in the United States in 1917 was about 690,000 short tons, compared with 702,610 tons in 1916 and 605,915 tons in 1915.

The Joplin district gained nearly 20,000 tons in output. This gain was made during the early part of the year, however, for the increasing cost of operating in the sheet-ground districts and the declining price of concentrates caused practically all those mines to close and reduced the output of sheet-ground concentrates from a weekly average of 3,000 tons in 1916 to an average of about one-third of that quantity in recent weeks. This loss, which is permanent, involves a net reduction of the zinc resources of the country of over 50,000 tons of recoverable zinc a year, as well as of lead concentrates containing 15,000 tons of lead.

New Jersey Gain 10,000 Tons.

New Jersey increased its output over 10,000 tons, the upper Mississippi Valley district gained 5,000 tons, and Arkansas made a creditable increase. Montana fell off nearly 25,000 tons, the loss being due largely to the strike in the Butte district. Colorado lost 10,000 tons, Utah 5,000 tons, New Mexico 4,000 tons, Idaho and California 3,000 tons each, and Nevada 2,000 tons. Of the total production, the Eastern States contributed 154,000 tons, or 22 per cent.; the Central States 293,000 tons, or 43 per cent., and the Western States 243,000 tons, or 35 per cent. In 1916 the corresponding quotas were:—Eastern States, 20 per cent.; Central States, 38 per cent.; and Western States, 42 per cent.

The following figures have been compiled without change by C. E. Siebenthal, of the United States Geological Survey, from reports furnished by all active smelters of zinc ores, showing their output for the first 11 months of the year and their estimated output for December. Figures showing the imports and exports for 10 months were obtained from the Bureau of Foreign and Domestic Commerce, and to these figures have been added estimates for the remainder of the year.

Smelter Capacity Greatly Reduced.

Owing to the depression in the spelter industry and the necessity of curtailing production, two plants in Kansas, one in Chanute and the other at La Harpe, have been dismantled, and nine more plants in Kansas and Missouri will be dismantled. Twenty zinc smelters were not in operation. The second column in the following table shows the maximum retort capacity by States before any plants were dismantled, and it probably represents the maximum retort capacity in the United States for all time:—

Zinc-Smelting Capacity, 1917.

State.	Maximum number of retorts.	Retorts in operation Dec. 15, 1917.	Idle retorts Dec. 15, 1917.	Retorts under construction.
Illinois	47,568	34,232	13,336	....
Kansas	44,054	11,826	29,406	....
Oklahoma ...	77,899	50,491	27,408	....
Other States..	60,090	41,242	18,848	840
Totals	229,611	137,791	88,998	840

As shown by the table, 88,998 retorts out of 225,637, or 40 per cent., were idle. A number of additions to capacity that were planned early in the year were abandoned. The only retorts now under construction are the block of 840 at the Terre Haute, Ind., plant of the Grasselli Chemical Company. The new smelter of the United Zinc Smelting Corporation at Moundsville, W. Va., has two blocks of 1,728 retorts completed, but they have not been operated, and no more are under construction. The acid plant, however, is being operated. The smelter and acid plant of the American Zinc and Chemical Company at Langcloth, Pa., is closed indefinitely on account of a strike. The furnaces and kilns are under repair. Three smelters with acid plants in Illinois are operating at half capacity on a hand-to-mouth basis on account of the difficulty of obtaining zinc concentrates due to the freight congestion.

The production of spelter from domestic ore in 1917 is estimated at 574,994 short tons, worth, at the average St. Louis spot quotation, about $102,350,000, and the production from foreign ore at 92,757 tons, a total of 667,751 tons, worth $118,860,000, compared to a total of 667,456 tons in 1916 (563,561 tons of domestic origin, and 104,005 tons of foreign origin), worth $178,878,000 at the average St. Louis selling price. This indicates practically the same production as in 1916, but a loss of more than $60,000,000 in value. Included in the output is 28,175 tons of electrolytic spelter, of which a part was refined by electrolysis from prime Western spelter. This was the product of five plants. The quantity of zinc dust prepared for market was over 7,000 tons. The output of secondary spelter redistilled at regular smelters and at the smelters with large retorts was about 21,600 tons.

Primary spelter was produced during the first half of the year at the rate of 722,000 tons a year, during the third quarter at the rate of 626,000 tons a year, and during the fourth quarter at the rate of 600,000 tons a year.

The production of primary spelter from both domestic and foreign ores, apportioned according to the States in which it was smelted, by six-months periods, was as follows:—

Spelter Production, 1915-16, by States—Short Tons.

State.	1916 First half.	1916 Second half.	1917 First half.	1917 Second half.
Illinois	90,082	90,268	95,149	79,668
Kansas	74,592	65,924	42,559	33,269
Oklahoma	73,298	90,790	109,130	80,389
Other States..	78,480	95,054	114,500	104,287
Totals	316,452	342,036	361,138	306,613
	658,488		667,751	

Imports of Zinc Ore Reduced; Exports of Spelter Stationary.

The imports of spelter (mostly scrap, probably) are estimated at 270 short tons, valued at about $25,000, compared with 684 tons in 1916. Zinc dust was imported to the amount of 380 tons, worth $90,000. The imports of zinc ore in 1917 were approximately 215,000 short tons, containing about 75,600 tons of zinc and worth about $4,550,000, compared with 385,964 tons of ore, containing 148,147 tons of zinc, in 1916. The imports of zinc ore in the first 10 months of 1917 originated as follows:—

Zinc Ore Imported Into United States, January to October, 1917.

From—	Ore. Short tons.	Zinc content. Short tons.	Value.
Canada	14,554	4,362	$294,699
Mexico	130,000	41,853	2,574,129
Spain	14,778	6,083	360,972
Italy	5,919	2,411	117,271
French Africa..	1,246	623	66,346
Australia	27,731	12,502	753,598
Totals	194,318	67,834	4,066,935

Exports of spelter and sheets made from domestic ore are estimated at 144,000 short tons, worth $37,000,000, compared with 163,137 tons, worth $51,312,990, in 1916. Exports of spelter made from foreign ore are estimated at 60,000 tons, valued at $11,900,000, compared with 43,230 tons in 1916. The exports of zinc manufactures fell off to $400,000 in 1917 from $572,286 in 1916. The exports of brass are estimated at 169,000 tons, valued at $104,300,000, compared with 122,466 tons, worth $72,683,626, in 1916. Manufactures of brass were exported to the value of about $134,500,000, compared with $241,668,081 in 1916. The value of loaded cartridges exported in 1917 was about $41,000,000, against $55,103,904 in 1916.

The exports of spelter made from foreign ore and of spelter and zinc sheets made from domestic ore are shown in the following table:—

Exports of Spelter and Sheet Zinc, by Months, 1916-17, in Short Tons.

	1916		1917	
Month.	Domestic.	Foreign.	Domestic.	Foreign.
January	10,483	3,531	15,531	2,450
February	10,328	3,919	15,549	4,960
March	8,171	575	17,408	5,230
April	9,133	1,902	12,669	3,248
May	8,583	4,811	19,528	9,946
June	11,309	5,459	13,095	1,757
July	12,709	4,508	8,863	2,240
August	18,662	4,232	11,283	758
September	19,126	965	8,749	19,625
October	19,994	6,110	6,067	2,451
November	18,988	4,260	....	....
December	15,652	2,958	....	....
Totals	163,137	43,230	128,733	55,765

Domestic Consumption Decreased.

The aparent domestic consumption of spelter in 1917 may be computed as follows:—The sum of the stock on hand at smelters at the beginning of the year, 17,598 tons, plus the imports, estimated at 270 tons, and the production, 667,751 tons, gives the total available supply—685,619 tons. From this are to be subtracted the exports of domestic spelter and sheets, 144,000 tons, the exports of spelter made from foreign ore, 60,000 tons, and the stock on hand at smelters at the end of the year (to be exact, on December 5), 50,107 tons, or a total of 254,107 tons, leaving a balance of 431,500 tons as the apparent domestic consumption. This calculation takes no account of the stocks of spelter held by dealers or consumers. This shows a decrease of 28,000 tons when compared with the 458,428 tons apparently consumed in 1916. This decrease is partly accounted for by the increase of 15,000 tons in the zinc content of exports of brass. On the other hand, the exports of manufactures of brass decreased nearly one-half. The normal ante-war consumption of spelter in the United States was about 300,000 tons.

The stock of spelter on hand at smelters, in transit or in the hands of agents December 15, 1917, was 50,107 tons, as compared with 17,598 tons in hand or transit January 1, 1917, with 33,147 tons June 30, and with 47,186 September 30.

Great Decline in the Price of Spelter.

The price of spelter at St. Louis started at 9.75c. a pound and after receding to 9c. at the middle of January rose gradually to 10.75c. early in March. The price dropped to 8.9c. late in April, rose gradually to 9.4c. by the end of May, but in a series of declines, with short recoveries, reached 7.75c., near which it closed the year. The average quoted price for the year for prime Western spelter at St. Louis was 8.9c. a pound, as compared with an average sales price for all grades of 13.4c. a pound in 1916, and an average sales price of 12.4c. in 1915.

London Price.

The London official price of spelter started at £50 5s. a long ton (10.6c. a pound), and, roughly paralleling the St. Louis price, rose to £58 10s. a long ton (12.4c. a pound) early in March, declined again late in March, rose two-tenths of a cent early in April, while the St. Louis price was dropping a cent a pound, and then, owing to governmental control, settled back to £54 a long ton (nearly 11.5c. a pound), at which point the nominal price has since remained. The average London price for the year was £54 2s. a long ton (nearly 11.5c.).

The foregoing St. Louis prices are those of the ordinary commercial grade of spelter. High-grade spelter suitable for cartridge spinning has been so much in demand that it has brought a good premium.

Most spelter is sold for future delivery, and in the preceding years of the war the average price has been considerably lower than the average spot quotations. For the first six months of 1917, however, spelter for future delivery brought within a half cent of spot spelter and in the last half of the year commanded a small premium over spot spelter. Taking into consideration the high grade of the spelter sold, the average selling price of spelter must have been above the average quotation for spot spelter, and the total value indicated elsewhere must be somewhat under the real figures.

LIME PRODUCTION IN 1917 TOTALED LESS THAN RECORD MADE IN PREVIOUS YEAR

Estimated Output 3,663,818 Short Tons, as Against 4,073,433 Short Tons in 1916—Vermont Showed 23 Per Cent. Increase.

The estimated production of lime made and sold in 1917 in the United States, including Porto Rico and Hawaii, was 3,663,818 short tons, a decrease of 10 per cent. compared with the revised total for the record year, 1916, which was 4,073,433 short tons. It surpassed, however, all records previous to 1916. This estimate is based on returns made by the principal producers to G. F. Loughlin, of the United States Geological Survey.

Of the 42 producing States only 11 reported increased sales. Virginia and Indiana were the only States in the group having sales of more than 100,000 tons to show increase, which amounted to 1 per cent. and 3 per cent., respectively. Other States of this group showed decreases ranging from 5 per cent. (Pennsylvania) to 36 per cent. (Wisconsin). Vermont, with an output of 53,143 tons, showed an increase of 23 per cent.

The following table shows the estimated output of all States that marketed more than 50,000 short tons:—

Estimated Production of Lime in 1917

Hydrated Lime Sales.

State.	Total lime. Tons.	Per cent. of change.	Hydrated lime. Tons.	Per cent. of change.
Pennsylvania	921,995	— 5	151,253	+ 16
Ohio	511,687	—10	332,475	— 5.5
Virginia	329,368	+ 1	*....	— 5.6
W. Virginia	242,643	—10	41,390	— 14
Missouri	186,024	— 7	28,684	+ 17
Wisconsin	171,944	—36	12,800	— 25
Maryland	132,644	—16	24,265	— 24
Mass.	128,114	—12	*....	— 35
Indiana	124,788	+ 3	23,993	+ 5.7
Maine	115,207	—83	*....	— 11
New York	105,728	—10	8,736	— 20
Tennessee	100,370	— 8	15,330	+ 4.7
Michigan	73,432	—15	*....	+ 20
Alabama	65,971	— 2	7,186	+ 6
Connecticut	65,327	—28	*....	+ 41
Illinois	63,476	—20	*....	+11.8
Vermont	53,143	+23	*....	+141.5
California	51,697	— 9	*....	+ 9.6
Texas	51,275	— 5	14,416	— 1
Other States.	168,895	....	59,229	.....
Totals	3,663,818	—10	719,757	+ .3

* Included in "Other States."

The estimated sales of hydrated lime in 1917 amounted to 719,757 short tons, a slight gain (2,375 tons, or 0.3 per cent.) over the sales shown by the revised figures for 1916. This difference is so small that the final figures may not show a gain. This is the first year since statistics of hydrated lime have been collected by the Survey in which there has been no substantial gain in its production. The fact that hydrated lime held its own, however, during a year in which the decrease in the production of lime was so general indicates a relative increase in its use. No companies reporting sales of hydrated lime in 1916 failed to report sales in 1917, and 2 new hydrating plants reported production, 1 in Arkansas and 1 in Idaho. The largest percentages of decrease in the production of hydrated lime shown in the foregoing table were made in States whose product is used largely for building.

The prices of lime, which generally increased in 1916, continued to rise throughout the country in 1917, though not in proportion to the continued increase in cost of production. A few companies in widely separated parts of the country were obliged to close their plants, partly on account of excessive costs but particularly because of shortage in fuel and labor. These conditions and a shortage of railway cars caused decreased production even where the demand for lime was reported good.

The building lime trade declined in all parts of the country. The unprecedented demand for building lime in 1916 continued until February, 1917, when the effects of the war augmented in some Northern districts by severe weather, brought it to a close. A fair to good demand continued in many districts, however, through the spring, and then a general decline in building set in. This decline was due to the uncertainties of war, to increased shortage of labor, fuel, and cars, and to the fact that, lime being perishable, the trade would not order large car lots as demanded by the railroads.

Chemical Demands.

The demand for lime by chemical and metallurgical plants surpassed that of the previous record year, 1916, and the demand by paper mills and tanneries apparently also appeared good. The sales of agricultural lime increased in some districts, and decreased in others, owing mainly to the difficulties attending manufacture and to shortage of farm labor.

In the New England States the estimated total production of lime in 1917 showed a decrease of 17 per cent. compared with the production in 1916. The output of hydrated lime in 1917, however, showed an increase of 65 per cent. All producers reported increases in price up to 40 per cent. Costs also were higher, and some producers stated that by the close of 1917 the cost of production had more than doubled. Labor and fuel were scarce and transportation facilities poor. In some districts the shortage of labor for supplying wood fuel has become so great that it is feared that wood-burning kilns may remain idle during a considerable part of 1918. The demand for building lime as a whole was decidedly less than in 1916, some producers reporting a decline of 40 per cent. A few companies, however, reported good demand, and some stated that the decline was not evident until late in the year.

Middle Atlantic States.

In the Middle Atlantic States (New York, Pennsylvania, New Jersey, and Maryland) the estimated total production of lime in 1917 was 14 per cent. less than in 1916, but that of hydrated lime increased nearly 8 per cent. Prices were almost uniformly reported higher, a few producers reporting increases of 25 to 34 per cent. Costs showed greater increases, however, one producer reporting an increase of 30 per cent. in selling price but an increase of 150 per cent. in costs. Shortage of labor, fuel and cars also curtailed output, and, together with high cost of operating, forced some plants to remain idle during the greater part of the year. In these States the building lime trade was prevaillingly dull. Although a few producers reported that the demand was the same or slightly improved in 1917 compared with 1916, most of them reported marked decline, ranging from 10 to 50 per cent. in Pennsylvania, and even to 75 per cent. in New York and New Jersey. The demand for chemical lime, however, which increased greatly in 1916, continued to increase in 1917, according to most producers, who reported a demand far in excess of their producing capacity. Comments on the agricultural lime industry were about equally divided as regards improvement or decline. Some reported increase of as much as 30 per cent.; others decreases up to 50 and even 65 per cent. The decline was attributed mainly to the prevailing difficulties of production and to shortage of farm labor, which prevented a demand in keeping with the country's agricultural needs. The demand for lime from other sources, notably paper mills, tanneries, and metallurgical plants, was the same as or better than in 1916. This statement applies also to dead-burned dolomite for refractory use.

Southern States.

The Southern States—those south of the Potomac and the Ohio and east of the Mississippi—produced 762,000 tons of lime in 1917, which was nearly 5 per cent. less than in 1916, all States except North Carolina showing decrease. This quantity included 73,000 tons of hydrated lime, a loss of 6 per cent. This loss was due to decreased production in West Virginia, which more than offset gains in Alabama, Florida and Tennessee. Prices were uniformly reported higher, though no remarkable increases were mentioned. About three-fifths of the producers reported a decline in the demand for building lime, especially in the last half of the year. One company in Tennessee attributed the decline mainly to lack of cars, which prevented the supplying of a good demand. Another company in Tennessee had to close in December owing to lack of coal. Practically all producers reporting sales of chemical lime stated that the demand in 1917 was as good as or better than in 1916. About two-thirds of the producers reported a decrease in the sales of agricultural lime, the others reporting them the same or improved. Two producers reported good demand but inability to supply it owing to shortage of fuel and labor. Two producers reported decrease in lime sold to sugar factories.

East-Central.

The East-Central States, including Ohio, Indiana, Illinois, Michigan and Wisconsin, produced 945,327 short tons of lime in 1917, 16 per cent. less than in 1916. This quantity included 383,000 short tons of hydrated lime, a decrease of 5 per cent. All producers reported an increase in price, one stating an increase of 80 per cent. to equalize increase in cost of production; but more than three-fourths of them reported marked decline in the building lime trade. Decreases ranging from 30 to 65 per cent. were reported by producers in Wisconsin. The demand in Ohio was reported good, above normal during the first half of the year, but production was curtailed by the prevailing conditions of labor, fuel and transportation. The chemical-lime industry was generally reported better than in 1916.

The agricultural lime trade in 1917 was reported poorer by about two-fifths of the producers, the remainder reporting trade equal to or better than that in 1916. Increased sales to paper mills, tanneries and glass factories were reported by a few producers, the amount of increase depending largely on transportation conditions.

Mid-Central.

The West-Central States, among which Missouri, Minnesota, Iowa, South Dakota, and probably Kansas were productive, produced 222,700 short tons of lime in 1917, 5 per cent. less than in 1916. Increases of 6 and 9 per cent., respectively, were shown, however, by Minnesota and Iowa. Very little hydrated lime was produced in any of these States except Missouri, whose output is shown in the table. The increase in price ranged up to 20 per cent. The demand was reported good by producers in Minnesota and Iowa and by more than half of those in Missouri, but production was retarded by difficulties in transportation. The few producers of chemical lime reported increased activity, and the demands for agricultural and other lime continued essentially the same as in 1916.

Southwest.

The Southwestern States, including Arkansas, Oklahoma, Texas and New Mexico, produced 73,400 short tons of lime in 1917, 5 per cent. less than in 1916. Arkansas's estimated production, however, showed an increase of about 300 tons. Hydrated lime was produced in Texas and Arkansas. Increased prices were reported by all producers. The building lime trade, slightly improved in Arkansas, was somewhat poorer in Texas. Two producers in Oklahoma reported large increase in sales, but the State as a whole showed a large percentage of decrease. The demand for chemical lime improved in Texas and Arkansas; that for agricultural lime improved in Arkansas but declined in Texas.

The Rocky Mountain States, including Montana, Wyoming, Colorado and Utah, produced 20,630 short tons of lime, a decrease of 20 per cent. compared with 1916, and a larger decrease compared with 1915. A gain was made, however, in Colorado. Prices increased. The demand for building lime remained about the same except in Utah, where it declined. The demand for chemical lime increased in Colorado and remained the same in Utah. There continues to be little or no demand for agricultural lime in these States.

Pacific Coast.

The Pacific Coast States here reported include Idaho, Nevada and Arizona, which are closely allied with Washington and California in the lime industries. This group of States produced 103,981 short tons of lime in 1917, or 7.6 per cent. less than in 1916. Increased production was reported, however, from Idaho and Nevada. This quantity included 11,022 tons of hydrated lime, 3.8 per cent. less than in 1916, produced in Washington, California, Arizona, and from a new plant in Idaho. Prices remained about the same in Nevada but increased in the other States. In Southern California and Arizona prices had increased as much as 50 per cent. by the end of 1917, and further advances were predicted. These increases followed increases in the cost of oil fuel (100 to 150 per cent.), wood fuel (15 per cent.), and labor (40 per cent.). The building lime trade as a whole declined, but was reported improved by a few producers in Idaho and Washington. The usual difficulties with labor and transportation were cited as causes for the decline. Decreases of as much as 40 per cent. were reported from parts of Washington and California. There was also a general decline in sales of agricultural lime, and some companies reported decline in sales of lime for chemical works; others, however, reported increased sales of this product and a great increase in fluxing lime for steel plants.

PARAGUAY PROVES FAVORABLE FIELD FOR AMERICAN DRUGS AND DRUG SUNDRIES

Official government statistics show that Paraguay is proving to be a very favorable field for the sale of American drug products. Drugs, proprietary medicines, and druggists' sundries of American manufacture are found in practically all the pharmacies in considerable quantities. Importers of these goods generally express satisfaction with American products, and the prospects seem to be good for an increased trade in all lines of such supplies from the United States.

Standard proprietary preparations, such as those put up by several well-known establishments in the United States, find special favor there, and are prescribed regularly by physicians.

Previous to the war Germany controlled a larger share of the drug trade with Paraguay than any other country. The United States, France, and England were close competitors. The trade with Germany has practically disappeared. The imports of drug products as a whole likewise have declined, and in 1917 amounted to less than half the total for 1913. Market conditions, however, seem to be recovering somewhat since the crisis that followed the opening of the war, as is indicated by the statistics of drug imports for the first ten months of 1917, which were considerably larger than those for either 1915 or 1916.

The quantity of drugs imported now is much smaller than in normal times. Just previous to and during 1913, when conditions were much more prosperous in Paraguay, the drug houses purchased unusually large stocks of supplies, and when the crisis came and retail sales fell off the goods that were on hand served to supply the retail trade of the country. These now are being exhausted. Many articles formerly imported exclusively from Germany and other articles which came from England and France can no longer be found in the stores. American drug exporters who are interested in the South American trade should easily find an increased market in Paraguay for all lines of such goods.

The lack of a parcel-post arrangement between Paraguay and the United States hampers the extension of American trade in these lines.

It is well for American drug exporters who wish to build up a permanent trade in Paraguay to register their special trade-marks in Asuncion. According to the laws of Paraguay anybody may register any trade-mark in his own name. It happens where foreign exporters neglect to register their trade-marks in this country that unscrupulous persons register them in their own names. This either deprives the exporters of the right to sell under their own trade-marks, or compels them to pay for their use when registered in other names.

There are no general drug-importing houses in Paraguay. Each drug company as a rule imports its own stocks direct from the foreign markets. Probably not more than four or five drug stores in Paraguay on an average carry stocks worth as much as $80,000 or $100,000 in United States money.

Correspondence with the trade there should be in the Spanish language. All weights and measures should be quoted in terms of the metric system. Expressed otherwise they have no meaning for the Paraguayan merchant, and many opportunities for sales doubtless would be lost.

All foreign patented preparations must be analyzed by the government chemist of Paraguay before sale to the public is permitted. Once the analysis is made, it does not have to be repeated, so long as the statement that accompanies each package appears to be genuine and corresponds to the results obtained by the government chemist. The formula must appear on the labels.

IMPORTS ENTERED FOR CONSUMPTION INTO THE UNITED STATES

For the Fiscal Years Ended June 30, 1913-1917.

Abrasives, Corundum Grains Manufactured, Ground, Etc.

	Pounds.	Dollars.
1913	1,835,400	87,187
1914	1,113,961	61,026
1915	832,900	39,958
1916	663,826	29,471
1917	2,354,274	131,753

Abrasives, Crude, Artificial.

		Dollars.
1913	.....	190,057
1914	.....	235,465
1915	.....	255,474
1916	.....	547,848
1917	.....	1,367,251

Abrasives, Emery Grains Manufactured, Ground, Etc.

	Pounds.	Dollars.
1913	886,315	36,608
1914	846,191	33,949
1915	629,802	25,040
1916	458,581	18,497
1917	136,949	7,880

Abrasives, Emery Wheels, Files, Paper, Etc.

		Dollars.
1913	.....	15,006
1914	.....	20,506
1915	.....	17,342
1916	.....	35,042
1917	.....	34,620

Abrasives, Pumice Stone, Unmanufactured.

	Tons.	Dollars.
1913	5,558	44,474
1914	7,065	67,427
1915	6,060	47,469
1916	8,650	69,311
1917	7,205	76,620

Abrasives, Pumice Stone, Wholly or Partially Manufactured.

	Pounds.	Dollars
1913	3,845,326	17,417
1914	6,484,875	28,280
1915	6,013,747	27,152
1916	5,616,012	44,186
1917	7,796,173	64,865

Abrasives, Rottenstone and Tripoli.

		Dollars.
1913	.....	30,621
1914	.....	20,858
1915	.....	24,796
1916	.....	38,613
1917	.....	23,315

Acetone.

	Pounds.	Dollars.
1914	2,760	307
1915	235,917	21,105
1916	179,497	14,424
1917	.....	.....

Not stated prior to 1914.

Acetanilid.

	Pounds.	Dollars.
1914	1,060	164
1915	800	889
1916	.....	.....
1917	15	22

Not stated prior to 1914.

Acetphenetidin.

	Pounds.	Dollars.
1915	39,990	27,385
1916	203	1,532
1917	3,280	40,352

Not stated prior to 1915.

Acid, Acetic Anhydrid.

	Pounds.	Dollars.
1913	309,643	51,632
1914	150,892	23,240
1915	3,552	1,010
1916	18,177	10,013
1917	9,060	7,485

Acid, Acetic or Pyroligneous.

	Pounds.	Dollars.
1913	39,648	3,036
1914	27,750	1,952
1915	312,850	16,419
1916	504,858	53,960
1917	201,004	28,492

Acid, Acetylsalicylic (Aspirin).

	Pounds.	Dollars.
1914	22,841	11,873
1915	112,602	53,792
1916	229	311
1917	501	2,136

Not stated prior to 1914.

Acid, Arsenic or Arsenious.

	Pounds.	Dollars.
1913	5,164,768	203,525
1914	3,034,351	110,179
1915	2,789,531	106,530
1916	2,458,694	104,988
1917	1,984,480	159,429

Acid, Benzoic.

	Pounds.	Dollars.
1913	863,015	133,887
1914	278,896	51,701
1915	132,666	25,442
1916	25,155	79,856
1917	13,547	52,988

Acid, Boracic.

	Pounds.	Dollars.
1913	362,400	13,897
1914	527,201	22,380
1915	401,684	18,002
1916	424,219	22,145
1917	404,210	24,590

Acid, Carbolic.

	Pounds.	Dollars.
1913	8,345,631	688,771
1914	8,393,216	531,535
1915	3,106,445	179,680
1916	2,246,256	154,841
1917	772,667	56,878

Acid, Chromic.

	Pounds.	Dollars.
1913	8,522	1,682
1914	7,778	1,220
1915	6,505	1,394
1916	.....	.....
1917	.....	.....

Acid, Citric.

	Pounds.	Dollars.
1913	8,677	2,916
1914	652,210	204,347
1915	722,434	447,131
1916	171,877	107,608
1917	157,528	91,463

Acid, Fluoric and Hydrofluoric.

	Pounds.	Dollars.
1913	12	5
1914	305	22
1915	150	11
1916	17	33
1917	.....	.....

Acid, Formic.

	Pounds.	Dollars.
1913	502,685	22,414
1914	1,119,745	48,826
1915	534,895	20,641
1916	131,719	19,627
1917	385,463	95,074

Acid, Gallic.

	Pounds.	Dollars.
1913	51,326	17,086
1914	61,635	20,429
1915	41,558	14,902
1916	5,101	1,965
1917	.....	.....

Acid, Glycerophosphoric, Salts and Compounds.

	Pounds.	Dollars.
1914	24,789	23,066
1915	15,953	17,978
1916	7,668	8,242
1917	6,853	9,249

Not stated prior to 1914.

Acid, Hydrochloric or Muriatic.

	Pounds.	Dollars.
1913	440	14
1914	254,480	1,450
1915	3,532,076	20,894
1916	4,215,491	27,202
1917	1,108,308	8,191

Acid, Lactic.

	Pounds.	Dollars.
1913	158,754	19,029
1914	276,237	30,423
1915	143,291	26,787
1916	17,845	10,930
1917	100	160

Acid, Nitric.

	Pounds.	Dollars.
1913	100	8
1914	.....	.....
1915	356,558	17,776
1916	224,699	11,487
1917	13	2

Acid, Oxalic.

	Pounds.	Dollars.
1913	8,046,380	402,960
1914	8,780,857	433,783
1915	4,496,679	262,422
1916	522,549	166,117
1917	1,183,256	527,827

Acid, Phosphoric.

	Pounds.	Dollars.
1913	504,383	76,907
1914	528,827	63,222
1915	265,193	39,120
1916	71,668	12,937
1917	13,966	4,225

Acid, Phthalic.

	Pounds.	Dollars.
1913	75,695	20,511
1914	63,574	15,597
1915	17,925	4,498
1916	.....	.....
1917	.....	.....

Acid, Picric or Nitro Picric.

	Pounds.	Dollars.
1913	85,068	18,339
1914	.....	.....
1915	20,091	4,278
1916	.....	.....
1917	.....	.....

Acid, Pyrogallic.

	Pounds.	Dollars.
1913	9,512	9,278
1914	22,615	20,496
1915	10,564	9,514
1916	169	227
1917	.....	.....

Acid, Salicylic.

	Pounds.	Dollars.
1913	31,144	6,500
1914	18,821	4,425
1915	82,617	24,408
1916	160	336
1917	5,033	3,114

Acid, Silicic.

	Pounds.	Dollars.
1913	121,344	6,486
1914	.....	.....
1915	3,086	586
1916	15	6
1917	.....	.....

Acid, Stearic or Stearin.

	Pounds.	Dollars.
1913	119,619	12,160
1914	100,088	9,593
1915	32,795	3,465
1916	40,979	6,029
1917	538	75

Acid, Sulphuric, or Oil of Vitriol.

	Pounds.	Dollars.
1913	34,624	512
1914	6,725,999	40,559
1915	7,382,139	44,008
1916	6,236,290	61,352
1917	667,008	6,617

Acid, Tannic or Tannin.

	Pounds.	Dollars.
1913	1,540	768
1914	12,892	4,326
1915	49,493	17,047
1916	2,229	684
1917	160	41

Acid, Tartaric.

	Pounds.	Dollars.
1913	78,942	15,747
1914	848,575	203,850
1915	820,105	273,880
1916	198,873	84,373
1917	268,180	102,478

Acid, Valerianic.

	Pounds.	Dollars.
1913	1,019	860
1914	1,161	750
1915	2,163	1,774
1916	600	390
1917	50	491

Acids, All Other Not Specially Provided For.

		Dollars.
1913	.....	86,539
1914	.....	94,078
1915	.....	73,849
1916	.....	36,434
1917	.....	85,257

Aconite.

	Pounds.	Dollars.
1913	12,946	1,065
1914	4,267	321
1915	8,821	962
1916	6,720	638
1917	34,285	8,724

Acorns, Raw, but Unground.

	Pounds.	Dollars.
1913	7,165	216
1914	3,613	208
1915	4,396	198
1916	.....	.....
1917	2,420	41

Agar-Agar.

	Pounds.	Dollars.
1914	189,232	54,319
1915	344,119	92,979
1916	352,931	110,410
1917	431,622	162,527

Not stated prior to 1914.

Albumen, Blood.

	Pounds.	Dollars.
1913	177,795	27,847
1914	90,380	13,239

Not stated after 1914.

Albumen, Egg.

	Pounds.	Dollars.
1913	1,246,744	406,594
1914	1,574,271	487,905

Note.—Stated separately after 1914; see following classes.

Albumen, Egg, Dried.

	Pounds.	Dollars.
1915	1,280,398	402,966
1916	1,670,986	751,976
1917	2,669,254	1,443,936

Albumen, Egg, Frozen or Liquid.

	Pounds.	Dollars.
1915	691,081	92,807
1916	1,451,376	201,509
1917	2,989,685	816,762

Albumen, Not Otherwise Provided For.

	Pounds.	Dollars.
1913	15,831	3,421
1914	382,589	58,175
1915	258,057	48,941
1916	81,787	25,516
1917	106,200	34,057

Alcohol, Grain.

	Proof gallons.	Dollars.
1913	135,250	22,780
1914	109,830	19,365
1915	40,532	6,707
1916	59,198	7,286
1917	4	8

Alcohol, Methyl or Wood.

	Gallons.	Dollars.
1913	362	387
1914	109,022	42,598
1915	39,485	11,880
1916	46,829	9,496
1917	11,267	4,502

Alizarin, Natural or Artificial, and Dyes Derived Therefrom.

	Pounds.	Dollars.
1913	8,219,087	1,824,973
1914	806,764	246,196
1915	.....	.....

Stated as follows class after October 3, 1913.

Alizarin and Derivatives, Natural or Synthetic, and Dyes Derived from.

	Pounds.	Dollars.
1914	1,828,074	599,648
1915	5,992,878	1,586,367
1916	71,834	44,282
1917	99,057	127,240

Alum, Alum Cake, Patent Alum, Sulphate of Alumina and Aluminous Cake.

	Pounds.	Dollars.
1913	4,129,160	39,044
1914	4,119,481	47,759
1915	3,904,561	41,166
1916	2,482,663	45,491
1917	1,636,989	56,768

Alumina, Hydrate of, or Refined Bauxite.

	Pounds.	Dollars.
1913	2,252,156	37,812
1914	1,639,027	26,328
1915	202,968	3,680
1916	418	260
1917	.....	.....

Aluminum, in Crude Form, Scrap and Alloys of Which Aluminum Composes Chief Value.

	Pounds.	Dollars.
1913	26,642,112	4,247,580
1914	16,421,076	2,801,911
1915	13,925,919	2,364,044
1916	8,203,886	1,824,106
1917	1,904,000	558,897

Aluminum Leaf.

	100 leaves.	Dollars.
1913	3,531	1,811
1914	1,385	141
1915	15,249	1,901
1916	39,920	5,468
1917	19,161	3,706

Amber, Manufactures of.

		Dollars.
1913	.....	7,202
1914	.....	9,332
1915	.....	4,516
1916	.....	5,436
1917	.....	248

Ambergris (Not Containing Alcohol).

	Ounces.	Dollars.
1913	608	10,964
1914	32	695
1915	1	37
1916	.....	.....
1917	10	2,771

Ammonia, Carbonate of.

	Pounds.	Dollars.
1913	258,376	16,173
1914	391,981	26,196
1915	784,321	49,122
1916	357,280	25,016
1917	244,840	18,264

Ammonia, Liquid Anhydrous.

	Pounds.	Dollars.
1913	.....	.....
1914	.....	.....
1915	307	35
1916	.....	.....
1917	200	46

Ammonia, Muriate of, or Sal Ammoniac.

	Pounds.	Dollars.
1913	10,387,148	504,330
1914	9,254,539	470,566
1915	4,788,325	241,713
1916	1,965,464	122,174
1917	1,856,696	178,274

Ammonia, Nitrate of.

	Tons.	Dollars.
1914	1,383	132,840
1915	1,637	193,907
1916	.....	.....
1917	87,300	4,015

Not stated prior to 1914.

Ammonia, Perchlorate of.

	Pounds.	Dollars.
1914	70,253	6,337
1915	72,676	6,515
1916	.....	.....
1917	275	53

Not stated prior to 1914.

Ammonia, Phosphate of.

	Pounds.	Dollars.
1913	7,433	493
1914	205,764	13,462
1915	71,782	5,394
1916	810	40
1917	1,000	200

Ammonia, Sulphate of.

	Tons.	Dollars.
1913	61,113	3,660,064
1914	83,597	4,900,058
1915	64,417	3,216,139
1916	19,404	1,371,007
1917	8,176	647,271

Aniline Oil.

	Pounds.	Dollars.
1913	2,015,318	171,047
1914	1,444,772	116,628
1915	1,407,305	240,165
1916	104,336	28,130
1917	.....	.....

Aniline Salts.

	Pounds.	Dollars.
1913	4,976,108	371,198
1914	3,083,467	222,728
1915	895,439	130,280
1916	16,084	3,978
1917	.....	.....

Annatto, Roucou, Rocoa or Orleans, and All Extracts of.

	Pounds.	Dollars.
1913	405,024	19,991
1914	507,250	26,341
1915	809,903	53,174
1916	903,271	69,811
1917	669,445	78,017

Anthracene and Carbozal Derivatives (except oil) and Colors and Dyes Derived Therefrom.

	Pounds.	Dollars.
1917	399,300	426,198

Not separately stated prior to 1917.

Anthracene and Anthracene Oil.

		Dollars.
1914	.....	32,175
1915	.....	49,949
1916	.....	2,561
1917	.....	2,258

Not stated prior to 1914.

Antimony Oxide, Salts and Compounds of.

	Pounds.	Dollars.
1913	1,819,323	97,447
1914	2,623,084	248,164
1915	1,797,265	219,665
1916	511,849	100,814
1917	192,099	46,190

Antipyrine.

	Pounds.	Dollars.
1914	7,686	11,608
1915	6,206	1,085
1916	222	2,202
1917	6,429	46,110

Not stated prior to 1914.

Antitoxins, Vaccine Virus, and All Other Animal Serums Used for Therapeutic Purposes.

		Dollars.
1913	.....	5,032
1914	.....	19,019
1915	.....	12,826
1916	.....	8,225
1917	.....	11,460

Apatite.

	Tons.	Dollars.
1913	2,930	22,535
1914	92	706
1915	.....	.....
1916	.....	.....
1917	.....	.....

Argols or Crude Tartar, or Wine Lees, Crude.

	Pounds.	Dollars.
1913	20,476,172	2,621,491
1914	5,712,667	545,105

Class dropped under 1913 tariff; see below.

Argols, Partly Refined, or Tartars and Lees Crystals.

	Pounds.	Dollars.
1913	5,498	763
1914	.....	.....

Class dropped under 1913 tariff; see below.

Argols or Crude Tartar, or Wine Lees Crude or Partly Refined.

	Pounds.	Dollars.
1914	23,810,043	2,264,618
1915	28,814,967	3,122,326
1916	34,602,184	5,233,516
1917	24,142,073	3,886,864

Arrowroot, Unmanufactured.

	Pounds.	Dollars.
1913	11,327	668
1914	8,615	518
1915	134	6
1916	5,967	302
1917	30,776	1,613

Arsenic, and Sulphide of, or Orpiment.

	Pounds.	Dollars.
1913	3,475,592	354,284
1914	4,148,928	169,614
1915	3,981,661	178,750
1916	2,794,254	272,795
1917	2,373,701	175,811

Articles Manufactured in the United States Returned — Quicksilver Flasks or Bottles, and Drums Used in Exporting Acids.

		Dollars.
1913	.....	259,123
1914	.....	280,620
1915	.....	180,676
1916	.....	204,642
1917	.....	168,955

Artists' Colors, in Tubes, Pans, Cakes, Etc.

		Dollars.
1913	.....	136,894
1914	.....	211,305
1915	.....	186,728
1916	.....	129,653
1917	.....	163,958

Ashes, Wood and Lye of, and Beet Root Ashes.

		Dollars.
1913	.....	36,493
1914	.....	27,884
1915	.....	41,522
1916	.....	43,839
1917	.....	55,226

Asphaltum and Bitumen, Crude, Except Limestone Rock Asphalt.

	Tons.	Dollars.
1913	188,725	750,685
1914	45,876	171,981
1915	79,561	465,717
1916	130,039	700,940
1917	161,622	896,989

Aspirin.

See "Acid, Acetylsalicylic."

Balsam Copaiba, Crude.

	Pounds.	Dollars.
1913	206,447	66,361
1914	245,435	71,339
1915	273,616	59,921
1916	204,464	70,868
1917	308,545	124,122

Balsam Fir, or Canada, Crude.

	Pounds.	Dollars.
1913	3,691	1,827
1914	13,884	12,505
1915	18,610	14,636
1916	7,113	3,934
1917	4,176	3,897

Balsam Peru, Crude.

	Pounds.	Dollars.
1913	48,986	61,702
1914	25,021	29,701
1915	27,506	32,735
1916	40,657	112,270
1917	58,933	175,355

Balsam Storax, or Styrax, Crude.

	Pounds.	Dollars.
1913	35,361	5,223
1914	5,607	798
1915	11,445	1,550
1916	11,696	5,528
1917	10,892	26,550

Balsam Tolu, Crude.

	Pounds.	Dollars.
1913	57,277	29,552
1914	42,138	19,063
1915	39,750	13,993
1916	61,579	17,233
1917	62,820	18,255

Balsam, All Other, Crude.

	Pounds.	Dollars.
1913	46,000	12,149
1914	33,311	12,410
1915	5,999	4,214
1916	2,503	1,312
1917	12,849	4,235

Balsams, Fir or Canada, Advanced in Value by Any Process.

	Pounds.	Dollars.
1914	.....	.....
1915	205	154
1916	10	18
1917	25	43

Not stated prior to 1914.

Barium, Carbonate of, Precipitated.

	Pounds.	Dollars.
1913	22,182,617	20,143
1914	4,995,451	46,425
1915	344,588	7,864
1916	6	2
1917	804	177

Barium, Chloride of.

	Pounds.	Dollars.
1913	2,926,159	26,741
1914	6,110,388	64,563
1915	4,686,029	60,532
1916	50	10
1917	6,614	608

Barium, Dioxide (Binoxide) of.

	Pounds.	Dollars.
1913	3,507,508	215,500
1914	6,085,798	529,139
1915	4,084,144	317,262
1916	546,442	48,451
1917	.....	.....

Bark, Cinchona or Other, from Which Quinine May Be Extracted.

	Pounds.	Dollars.
1913	3,329,973	354,593
1914	3,654,968	464,411
1915	3,951,196	561,802
1916	3,967,320	777,637
1917	2,531,397	685,936

Bark, Hemlock.

	Cords.	Dollars.
1913	5,502	31,965
1914	4,483	25,655
1915	3,672	19,967
1916	3,388	17,855
1917	1,118	7,027

Baryta, Sulphate of, or Barytes, Unmanufactured.

	Tons.	Dollars.
1913	28,359	63,345
1914	32,550	63,270
1915	9,616	21,967
1916	15	245
1917	.....	.....

Baryta, Sulphate of, or Barytes, Manufactured.

	Tons.	Dollars.
1913	4,504	36,819
1914	5,379	42,627
1915	1,755	14,997
1916	.....	2
1917	210	3,813

Bauxite, Crude.

	Tons.	Dollars.
1913	30,863	119,848
1914	23,576	86,871
1915	12,870	50,557
1916	3,450	17,194
1917	6,403	22,568

Bay Rum, or Bay Water.

	Proof gallons.	Dollars.
1913	686	707
1914	483	620
1915	503	673
1916	335	341
1917	249	278

Beeswax.

	Pounds.	Dollars.
1913	328,297	254,704
1914	1,412,695	477,745
1915	1,565,338	440,047
1916	2,284,283	618,856
1917	2,711,514	904,557

Benzol.

	Pounds.	Dollars.
1917	3,175,906	273,108

Not separately stated prior to 1917.

Binitrotoluol.

	Pounds.	Dollars.
1917	110,461	13,612

Not separately stated prior to 1917.

Bismuth.

	Pounds.	Dollars.
1913	151,030	257,176
1914	133,190	241,445
1915	34,237	72,587
1916	64,251	165,925
1917	88,465	196,113

Blanco Polish.

		Dollars.
1913	.....	21,854
1914	.....	17,997
1915	.....	17,743
1916	.....	21,229
1917	.....	83,458

Blanc Fixe, or Artificial Sulphate of Barytes, and Satin White and Artificial Sulphate of Lime.

	Pounds.	Dollars.
1913	4,808,726	58,409
1914	4,752,474	60,641
1915	2,333,369	25,748
1916	492,723	11,523
1917	408,163	10,029

Bleacher's Blue.

		Dollars.
1913	.....	4,143
1914	.....	14,922
1915	.....	14,125
1916	.....	14,922
1917	.....	19,048

Not stated prior to 1913.

Bloodchar.

	Pounds.	Dollars.
1913	2,954	333
1914	26,274	1,789
1915	14,167	1,196
1916	15	16
1917	.....	.....

Blood, Dried.

		Dollars.
1913	.....	86,451
1914	.....	391,947
1915	.....	227,648
1916	.....	196,600
1917	.....	379,067

Blue, Berlin, Prussian, Chinese, Etc., in Pulp, Dry or Ground, in or Mixed with Oil or Water.

	Pounds.	Dollars.
1913	193,336	34,476
1914	275,174	50,149
1915	547,299	112,904
1916	185,294	110,901
1917	373,074	209,524

Bone Black, Lamp Black, Etc.

		Dollars.
1913	.....	31,056
1914	.....	27,604
1915	.....	24,459
1916	.....	2,396
1917	.....	6,388

Bone Char, or Bone Black, Not Suitable for Use as Pigment.

		Dollars.
1913	.....	12,484
1914	.....	77,717
1915	.....	120,715
1916	.....	86,724
1917	.....	80,163

Bones, Crude.

		Dollars.
1913	.....	565,566
1914	.....	829,730
1915	.....	756,015
1916	.....	755,700
1917	.....	826,142

Bone and Horn, Manufactures of.

		Dollars.
1913	.....	95,913
1914	.....	81,666
1915	.....	63,463
1916	.....	59,846
1917	.....	79,743

Bone Dust, or Animal Carbon and Ash, Fit Only for Fertilizer.

	Tons.	Dollars.
1913	33,919	818,307
1914	41,446	1,036,493
1915	23,440	584,748
1916	20,595	527,079
1917	14,305	383,541

Borax.

	Pounds.	Dollars.
1913	11,768	882
1914	686	93
1915	.....	.....
1916	.....	.....
1917	83	3

Bottle Caps, Collapsible Tubes and Sprinkler Tops, Not Decorated, Etc.

		Dollars.
1913	.....	24,123
1914	.....	50,425
1915	.....	28,420
1916	.....	15,166
1917	.....	13,899

Bottle Caps, Collapsible Tubes and Sprinkler Tops, Decorated, Etc.

		Dollars.
1913	.....	203,357
1914	.....	547,034
1915	.....	214,522
1916	.....	178,061
1917	.....	190,664

Bristles, Crude, Not Sorted.

	Pounds.	Dollars.
1913	18,913	13,306
1914	27,036	25,280
1915	45,467	3,336
1916	92,300	15,239
1917	128,894	52,431

Bristles, Sorted, Bunched, or Prepared.

	Pounds.	Dollars.
1913	3,479,666	3,319,904
1914	3,551,081	3,255,554
1915	3,726,625	3,348,533
1916	3,514,309	3,456,482
1917	4,456,284	4,678,801

Bronze Powder, Brocades, Flitters and Metallics.

	Pounds.	Dollars.
1913	1,405,502	420,308
1914	1,403,091	406,249
1915	1,063,206	288,054
1916	161,409	96,852
1917	524,032	283,976

Bronze, or Dutch Metal, in Leaf.

	100 leaves.	Dollars.
1913	763,071	104,329
1914	792,578	110,316
1915	896,038	110,163
1916	291,396	38,566
1917	306,497	81,277

Brown, Spanish, Indian Red and Colcothar, or Oxide of Iron.

		Dollars.
1913	.....	103,604
1914	.....	196,476
1915	.....	183,033
1916	.....	221,209
1917	.....	292,122

Brown, Vandyke, Cassel Earth or Cassel Brown.

		Dollars.
1913	.....	1,381
1914	.....	2,663
1915	.....	1,497
1916	.....	393
1917	.....	2,534

Brushes, Feather Dusters and Hair Pencils.

		Dollars.
1913	.....	2,074,141
*1914	.....	563,160

*Figures cover period from July 1 to October 3, 1913.

Stated separately after October 3, 1913.

Brushes.

		Dollars.
1914	.....	1,605,964
1915	.....	1,667,239
1916	.....	1,309,423
1917	.....	2,188,034

Buchu Leaves.

	Pounds.	Dollars.
1913	105,310	114,632
1914	125,368	130,352
1915	120,704	115,988
1916	94,520	85,452
1917	100,809	85,807

Cadmium.

	Pounds.	Dollars.
1913	1,000	1,508
1914	1,543	1,239
1915	264	278
1916	5	6
1917	.....	.....

Caffeine.

	Pounds.	Dollars.
1913	59,773	211,361
1914	80,350	260,323
1915	54,323	186,557
1916	1,267	15,228
1917	1,601	17,219

Caffeine Compounds.

		Dollars.
1914	.....	9,712
1915	.....	4,071
1916	.....	605
1917	.....	.....

Not stated prior to 1914.

Calcium, Acetate, Chloride, Carbide and Nitrate.

		Dollars.
1914	.....	53,455
1915	.....	1,206,394
1916	.....	3,596,969
1917	.....	3,808,281

Not stated prior to 1914.

Calcium Cyanamid or Lime Nitrogen.

	Tons.	Dollars.
1913	14,656	777,774
1914	29,536	1,596,004
1915	20,564	919,574
1916	38,023	1,633,366
1917	44,146	1,951,104

Calcium, Tartrate, Crude.

	Pounds.	Dollars.
1914	113,256	8,849
1915	1,755,954	161,566
1916	1,101,255	135,638
1917	371,910	51,418

Not stated prior to 1914.

Calomel, Corrosive Sublimate and Other Mercurial Medicinal Preparations.

		Dollars.
1913	.....	42,728
1914	.....	37,589
1915	.....	25,694
1916	.....	13,158
1917	.....	9,974

Camomile Flowers.

		Dollars.
1913	.....	14,176
1914	.....	6,252
1915	.....	13,113
1916	.....	27,810
1917	.....	64,432

Camwood.

	Tons.	Dollars.
1913	½	191
1914	.....	.....
1915	1	209
1916	30	5,991
1917	.....	.....

Candle Pitch or Tar, and Palm or Other Vegetable Stearin.

	Pounds.	Dollars.
1913	3,047,020	56,970
1914	2,203,223	40,004
1915	1,262,725	23,400
1916	853,140	21,596
1917	467,958	14,446

Candles and Tapers, Wax and Other.

		Dollars.
1913	.....	22,990
1914	.....	14,348
1915	.....	8,638
1916	.....	9,118
1917	.....	4,515

Cantharides.

	Pounds.	Dollars.
1913	8,788	5,562
1914	5,648	4,435
1915	14,047	12,266
1916	32,603	26,923
1917	25,623	47,857

Carbon Tetrachloride.

	Pounds.	Dollars.
1914	572,910	28,300
1915	342,854	18,139
1916	.....	.....
1917	2	2

Not stated prior to 1914.

Cassia Buds, Unground.

	Pounds.	Dollars.
1913	23,367	2,449
1914	173,449	10,101
1915	160,352	10,394
1916	197,056	16,585
1917	218,563	14,131

Cassia Buds, Ground.

	Pounds.	Dollars.
1917	139,224	21,672

Not stated prior to 1917.

Cassia, and Cassia Vera, Unground.

	Pounds.	Dollars.
1913	7,151,605	547,116
1914	5,216,426	358,218
1915	5,658,184	348,598
1916	7,487,156	466,161
1917	9,019,350	803,079

Castor or Castoreum.

	Ounces.	Dollars.
1913	9,245	5,384
1914	6,038	3,468
1915	13,035	5,344
1916	19,657	6,694
1917	24,427	8,250

Castor Beans or Seeds.

	Bushels.	Dollars.
1913	824,574	918,608
1914	1,043,928	1,154,085
1915	924,605	993,580
1916	1,071,969	1,556,465
1917	767,075	1,185,775

Catgut, Whipgut or Wormgut, Unmanufactured.

		Dollars.
1913	.....	139,125
1914	.....	133,551
1915	.....	198,081
1916	.....	253,578
1917	.....	316,491

Catgut, Whipgut or Wormgut, Manufactures of.

		Dollars.
1913	.....	3,427
1914	.....	62,466
1915	.....	68,492
1916	.....	9,790
1917	.....	4,867

Cement, Roman, Portland and Other Hydraulic.

	100 pounds.	Dollars.
1913	313,092	124,386
1914	374,471	163,460
1915	342,292	132,864
1916	19,960	9,182
1917	4,196	2,929

Chalk, Unmanufactured.

	Tons.	Dollars.
1913	150,010	120,949
1914	128,947	102,907
1915	120,225	91,188
1916	131,368	95,861
1917	143,216	131,385

Chalk, When Ground, Precipitated, or Otherwise Prepared, Including Tailor's, Billiard, Red or French.

	Pounds.	Dollars.
1913	2,536,622	79,731
1914	*	52,656
1915	*	36,621
1916	*	46,135
1917	.....	39,319

*Quantity not stated after 1913.

Chamois Skin.

		Dollars.
1913	.....	149,057
1914	.....	107,324
1915	.....	64,267
1916	.....	108,346
1917	.....	176,578

Charcoal.

		Dollars.
1913	.....	25,557
1914	.....	60,266
1915	.....	39,978
1916	.....	45,174
1917	.....	73,583

Chicory Root, Raw but Unground.

	Pounds.	Dollars.
1913	2,203,057	32,939
1914	1,580,925	22,028
1915	471,966	6,717
1916	.....	.....
1917	241,299	29,131

Chicory Root, Burnt or Roasted, Ground or Granulated.

	Pounds.	Dollars.
1913	469,309	19,356
1914	765,056	31,988
1915	409,234	13,991
1916	5,657	260
1917	111,972	8,252

China Clay, or Kaolin.

	Tons.	Dollars.
1913	263,838	1,753,822
1914	241,936	1,590,054
1915	230,484	1,506,555
1916	228,936	1,376,990
1917	206,730	1,212,099

Chloral Hydrate.

	Pounds.	Dollars.
1913	.....	.....
1914	644	241
1915	112	25
1916	1	2
1917	.....	.....

Chloroform.

	Pounds.	Dollars.
1913	942	1,643
1914	2,444	990
1915	26	43
1916	.....	.....
1917	.....	.....

2,274 pounds of the 1914 figures were valued at only 25 cents a pound; 170 pounds at $2.48 per pound.

Chlorophyll, Extract of.

		Dollars.
1912	4,461	3,586
1913	7,508	8,544
1914	10,125	8,503
1915	3,490	3,671
1916	190	192
1917	.....	.....

Chrome, Yellow or Green, and All Other Chromium Colors.

	Pounds.	Dollars.
1913	148,299	23,405
1914	134,460	22,412
1915	124,638	21,171
1916	27,929	5,586
1917	28,078	4,202

Chromium, Hydroxide, Crude.

		Dollars.
1914	.....	5,859
1915	.....	12,444
1916	.....	.....
Not stated prior to 1914.		
1917	.....	.....

Cinchona Bark, Alkaloids or Salts of, All Other, Except Sulphate of Quinia.

	Ounces.	Dollars.
1913	648,865	131,692
1914	452,292	117,915
1915	203,330	66,004
1916	231,100	82,167
1917	623,947	324,438

Cinchonidia.

	Ounces.	Dollars.
1913	809,395	43,680
1914	205,006	19,502
1915	69,487	8,223
1916	131,481	15,814
1917	221,272	17,590

Cinnamon, and Chips of, Unground.

	Pounds.	Dollars.
1913	1,405,832	188,267
1914	303,967	44,304
1915	528,254	74,081
1916	410,594	50,026
1917	564,248	77,272

Civet.

	Ounces.	Dollars.
1913	11,269	15,557
1914	2,761	3,978
1915	1,820	2,086
1916	9,600	12,099
1917	9,230	13,148

Clay, Common Blue and Grass-Almerode for Manufacturing Crucibles and Glass Melting Pots.

	Tons.	Dollars.
1913	23,218	211,005
1914	20,597	180,524
1915	12,274	107,146
1916	3,488	16,088
1917	412	2,353

Clay, Plasticene and Other Modeling.

		Dollars.
1913	.....	8,519
1914	.....	9,424
1915	.....	6,541
1916	.....	7,978
1917	.....	12,466

Clays or Earths, Not Specially Provided For.

	Tons.	Dollars.
1913	37,370	167,614
1914	37,572	210,574
1915	36,072	153,041
1916	34,677	148,916
1917	30,942	138,171

Cliffstone, Unmanufactured.

	Tons.	Dollars.
1913	5,626	6,164
1914	9,079	11,046
1915	7,428	8,977
1916	7,879	10,795
1917	9,096	15,264

Cloves, Unground.

	Pounds.	Dollars.
1913	2,734,992	481,761
1914	5,054,821	597,310
1915	5,346,665	595,546
1916	7,066,237	791,708
1917	3,867,851	532,345

Clove Stems, Unground.

	Pounds.	Dollars.
1913	32,830	1,333
1914	268	20
1915	4,391	760
1916	57,160	4,009
1917	1,120	174

Coal-Tar Colors or Dyes Not Specially Provided For.

		Dollars.
1913	.....	6,902,065
1914	.....	7,537,924
1915	.....	5,858,509
1916	.....	2,997,924
1917	.....	2,919,554

Coal-Tar Distillates, Not Medicinal, and Not Colors or Dyes.

		Dollars.
1914	.....	188,636
1915	.....	31,979
1916	.....	858,836
Not stated prior to 1914.		
1917	.....	78,665

Coal-Tar Preparations, Medicinal.

		Dollars.
1917	.....	381,256
Not stated prior to 1917.		

Cobalt and Cobalt Ore and Zaffer.

	Pounds.	Dollars.
1913	310,951	30,713
1914	197,009	115,038
1915	24,095	8,225
1916	144,170	186,124
1917	136,883	191,966

Cobalt, Oxide of.

	Pounds.	Dollars.
1913	28,729	14,405
1914	109,584	95,026
1915	109,155	180,087
1916	238,934	228,745
1917	236,822	220,263

Cocaine Ecgonine, and Salts of.

	Ounces.	Dollars.
1913	3,715	4,835
1914	3,291	4,101
1915	179	422
1916	4,275	5,887
1917	19,388	38,627

Cocculus Indicus.

	Pounds.	Dollars.
1913	.....	.....
1914	4,446	121
1915	9,550	388
1916	.....	.....
1917	7,410	2,818

Cochineal.

	Pounds.	Dollars.
1913	109,089	44,249
1914	138,139	53,200
1915	155,430	38,454
1916	772,416	358,914
1917	124,745	46,802

Coca Leaves.

	Pounds.	Dollars.
1913	1,175,780	139,035
1914	711,564	91,384
1915	1,048,312	98,870
1916	947,537	106,627
1917	634,932	90,131

Cocoa Butter, or Butterine, Refined, Deodorized Cocoanut Oil, and All Substitutes for Cocoa Butter.

	Pounds.	Dollars.
1913	3,634,986	990,566
1914	2,876,967	801,259
1915	126,028	35,863
1916	69,888	15,524
1917	24,280	7,581

Collodion and Celluloid and All Compounds of Pyroxylin.

		Dollars.
1913	.....	288,639
1914	.....	583,391
1915	.....	371,714
1916	.....	127,627
1917	.....	53,693

Colombo Root.

	Pounds.	Dollars.
1913	27,565	794
1914	4,587	134
1915	8,751	458
1916	48,867	3,442
1917	92,349	4,999

Coloring for Brandy, Wine, Beer or Other Liquors.

		Dollars.
1913	.....	1,925
1914	.....	1,628
1915	.....	842
1916	.....	192
1917	.....	225

Color Foils.

		Dollars.
1913	.....	10,925
1914	.....	7,347
1915	.....	2,516
1916	.....	.....
1917	.....	1,747

Copperas, or Sulphate of Iron.

	Pounds.	Dollars.
1913	6,196	174
1914	1,120	18
1915	4,750	95
1916	.....	.....
1917	.....	.....

Copper, Sulphate of, or Blue Vitriol.

	Pounds.	Dollars.
1913	11,051	728
1914	114,730	5,486
1915	45,239	2,156
1916	184,382	17,951
1917	15,952	2,233

Corks.

	Pounds.	Dollars.
1913	2,511,285	2,187,867
Stated separately after 1913; see below.		

Cork Stoppers.

	Pounds.	Dollars.
1914	888,500	728,317
1915	326,887	250,342
1916	269,806	170,746
1917	437,550	275,161

Cork Disks, Wafers or Washers, 3-16 Inch or Less in Thickness.

	Pounds.	Dollars.
1914	2,063,567	1,675,683
1915	1,926,864	1,165,540
1916	695,776	487,588
1917	2,815,515	1,973,342

Cork Insulation.

	Pounds.	Dollars.
1917	4,038,372	181,698
Not stated prior to 1917.		

Cork Paper.

		Dollars.
1917	.....	138,214
Not stated prior to 1917.		

Cork Waste, Shavings and Cork Refuse of All Kinds.

	Pounds.	Dollars.
1917	120,677,624	1,743,184
Not stated prior to 1917.		

Corkwood, or Cork Bark, Unmanufactured.

	Pounds.	Dollars.
1913	133,227,878	3,152,070
1914	88,282,529	2,646,018
1915	24,897,803	1,420,581
1916	32,866,700	1,517,366
1917	40,273,005	2,125,633

Cotton Batting.

	Pounds.	Dollars.
1914	42,102	4,378
1915	87,655	8,506
1916	105,169	10,458
1917	150,612	15,610
Not stated prior to 1914.		

Crayons, Including Charcoal Crayons or Fusains.

		Dollars.
1913	.....	12,925
1914	.....	18,359
1915	.....	15,090
1916	.....	11,535
1917	.....	12,945

Cream of Tartar.

	Pounds.	Dollars.
1913	66,718	11,797
1914	812,857	156,987
1915	764,868	166,922
1916	38,588	13,479
1917	98,609	28,488

Cresol.

	Pounds.	Dollars.
1917	4,790,699	329,738
Not separately stated prior to 1917.		

Crucibles of Stone and Earthenware.

		Dollars.
1914	.....	10,974
1915	.....	6,764
1916	.....	7,041
1917	.....	53,161
Not stated prior to 1914.		

Cryolite, or Kryolith.

	Tons.	Dollars.
1913	2,519	52,440
1914	2,167	47,435
1915	4,569	91,417
1916	3,962	84,497
1917	3,835	163,475

Cubebs.

	Pounds.	Dollars.
1913	166,307	53,666
1914	105,665	32,456
1915	87,538	23,451
1916	89,300	28,566
1917	125,558	46,442

Cudbear.

	Pounds.	Dollars.
1913	27,971	1,755
1914	15,863	1,661
1915	24,827	1,680
1916	55,948	6,512
1917	49,163	6,105

Curry and Curry Powder.

		Dollars.
1913	.....	12,087
1914	.....	11,807
1915	.....	9,872
1916	.....	8,669
1917	.....	10,624

Cuttlefish Bone.

	Pounds.	Dollars.
1913	218,617	30,355
1914	309,540	56,051
1915	292,239	52,041
1916	214,659	36,576
1917	230,271	52,838

Dandelion Root.

	Pounds.	Dollars.
1913	108,434	8,269
1914	109,658	9,389
1915	112,814	12,137
1916	29,378	6,487
1917	108,713	23,912

Decalcomanias, in Ceramic Colors.

	Pounds.	Dollars.
1913	80,094	144,890
1914	45,999	92,528
1915	22,411	62,462
1916	11,179	32,882
1917	8,471	27,393

Decalcomanias, All Other, Except Toys.

	Pounds.	Dollars.
1913	41,370	42,001
1914	132,805	131,494
1915	90,040	87,841
1916	51,840	55,634
1917	66,513	69,844

Divi Divi.

	Pounds.	Dollars.
1913	314,491	4,143
1914	29,032	461
1915	4,513,210	71,367
1916	16,467,455	310,572
1917	15,969,144	293,191

Dragon's Blood.

	Pounds.	Dollars.
1913	14,553	5,916
1914	26,283	9,407
1915	23,110	8,446
1916	20,218	10,602
1917	48,026	19,137

Eggs, Dried.

	Pounds.	Dollars.
1913	20,284	7,537
1914	38,061	12,640
1915	30,575	10,385
1916	38,993	9,876
1917	1,590,563	417,417

Eggs, Frozen or Otherwise, Prepared or Preserved, in Packages.

	Pounds.	Dollars.
1914	2,647,974	305,232
1915	2,815,511	198,654
1916	3,756,188	248,967
1917	2,171,338	178,627
Not stated prior to 1914.		

Eggs, Yolks of.

	Pounds.	Dollars.
1913	227,457	37,027
1914	675,058	168,972
1915	1,382,408	257,607
1916	2,919,019	373,152
1917	6,924,071	1,332,095

Enamel, Fusible and Glass.

		Dollars.
1913	.....	11,997
1914	.....	18,028
1915	.....	10,975
1916	.....	3,731
1917	.....	12,078

Enamel, Glass, White, for Watch and Clock Dials.

		Dollars.
1913	.....	15,855
1914	.....	13,284
1915	.....	7,331
1916	.....	4,030
1917	.....	13,604

Enamel Paints.

	Pounds.	Dollars.
1913	59,457	11,877
1914	96,174	17,316
1915	86,078	6,504
1916	54,546	8,987
1917	118,571	13,902

Ergot.

	Pounds.	Dollars.
1913	223,793	208,364
1914	185,704	102,640
1915	141,915	92,459
1916	123,015	73,896
1917	165,701	80,647

Ether, Ethyl Chloride.

	Pounds.	Dollars.
1913	11,241	7,903
1914	8,014	10,046
1915	.....	.....
1916	2,780	5 193
1917	8,917	5,207

Ether Fruit, Containing No Alcohol.

	Pounds.	Dollars.
1913	8¼	105
1914	1,331	1,737
1915	117	1,070
1916	.....	.....
1917	.....	.....

Ethers, Containing More Than 10 Per Cent. and Not More Than 50 Per Cent. Alcohol.

	Pounds.	Dollars.
1913	.....	7,029
1914	.....	1,868
1915	66	64
1916	140	169
1917	.....	.....
Quantity not stated prior to 1915.		

Ethers, Sulphuric.

	Pounds.	Dollars.
1913	755	120
1914	915	131
1915	849	189
1916	62	23
1917	.....	.....

Ethers, Not Specially Provided For.

	Pounds.	Dollars.
1913	508	303
1914	12,036	5,049
1915	6,301	4,500
1916	598	1,410
1917	26	93

Feather Dusters and Hair Pencils.

		Dollars.
1914	.....	2,491
1915	.....	3,590
1916	.....	5,754
1917	.....	7,035
Not separately stated prior to 1914.		

Fertilizer, Not Specially Provided For. (Used only for Manure.)

	Tons.	Dollars.
1913	115,257	2,190,816
1914	197,165	4,241,285
1915	100,155	2,208,193
1916	73,552	1,591,517
1917	71,374	1,567,307

Filter Tubes.

		Dollars.
1913	.....	6,038
1914	.....	7,437
1915	.....	6,639
1916	.....	2,749
1917	.....	7,359

Filter Masse or Filter Stock.

	Pounds.	Dollars.
1913	429,920	49,042
1914	485,420	53,974
1915	349,408	41,880
1916	54,349	8,356
1917	65,052	10,304

Flaxseed or Linseed Screenings.

	Pounds.	Dollars.
1914	1,143,429	4,748
1915	229,443	673
1916	.....	4,566
1917	.....	2,052
Not separately stated prior to 1914.		

Floral Essences Containing No Alcohol.

		Dollars.
1914	.....	87,086
1915	.....	145,973
1916	.....	265,956
1917	.....	408,936
Not stated prior to 1914.		

Floral or Flower Waters Containing No Alcohol.

		Dollars.
1913	.....	31,710
1914	.....	50,297
1915	.....	22,216
1916	.....	34,461
1917	.....	29,279

Fluorspar.

	Tons.	Dollars.
1913	23,786	77,535
1914	13,663	50,943
1915	6,925	27,951
1916	8,808	32,482
1917	12,008	87,380

Formaldehyde, Solution Containing Not More Than 40 Per Cent. Formaldehyde or Formaline.

	Pounds.	Dollars.
1913	.....	.....
1914	14,228	1,443
1915	7,700	814
1916	79,857	8,054
1917	23,935	2,349

Fuller's Earth.

	Tons.	Dollars.
1911	15,813	125,899
1912	16,177	138,111
1913	16,866	145,588
1914	19,367	174,276
Subdivided after 1914; see below.		

Fuller's Earth, Unwrought or Unmanufactured.

	Tons.	Dollars.
1915	745	5,268
1916	1,067	7,825
1917	975	7,846

Fuller's Earth, Wrought or Manufactured.

	Tons.	Dollars.
1915	18,754	163,540
1916	14,973	135,845
1917	15,077	159,071

Fustic.

	Tons.	Dollars.
1913	3,785	53,303
1914	7,121	100,501
1915	12,354	179,959
1916	17,469	289,913
1917	5,195	142,481

Galalith (Artificial Ivory) and Manufactures of.

		Dollars.
1913	.....	12,786
1914	.....	15,060
1915	.....	10,048
1916	.....	10,028
1917	.....	30,762

Gambier, or Terra Japonica.

	Pounds.	Dollars.
1913	17,037,805	784,931
1914	16,449,663	625,855
1915	14,169,250	542,200
1916	12,602,251	888,985
1917	10,861,904	863,675

Gas Liquor, Ammoniacal.

		Dollars.
1913	.....	35,246
1914	.....	29,336
1915	.....	31,466
1916	.....	26,783
1917	.....	23,335

Gelatin.

	Pounds.	Dollars.
1913	1,085,940	279,892
1914	2,439,440	768,215
1915	2,708,362	916,368
1916	1,657,065	319,173
1917	967,920	309,524

Gentian Root.

	Pounds.	Dollars.
1913	1,796,928	88,281
1914	2,181,935	109,119
1915	1,022,252	55,553
1916	788,307	63,240
1917	1,780,044	218,377

Ginger Root, Unground, Not Preserved or Candied.

	Pounds.	Dollars.
1913	7,856,401	406,197
1914	3,006,132	145,792
1915	3,310,391	156,973
1916	5,593,845	391,965
1917	4,307,279	411,965

Glass Demijohns and Carboys, Covered or Uncovered, Empty.

	Pounds.	Dollars.
1913	.....	6,481
1914	.....	3,899
1915	27,990	890
1916	4,731	298
1917	.....	.....
Quantity not stated prior to 1915.		

MERCK & CO.

St. Louis · NEW YORK · Montreal

Main Works at Rahway, N. J.

MEDICINAL ANALYTICAL

Chemicals

PHOTOGRAPHIC TECHNICAL

Glass Bottles, Vials and Jars, Plain Green or Colored, Molded or Pressed, and Flint, Lime, and Lead, Empty.

	Pounds.	Dollars.
1913	.....	205,267
1914	.....	214,130
1915	3,561,260	88,688
1916	1,351,813	24,049
1917	850,946	19,231

Quantity not stated prior to 1915.

Glass, Window—Cylinder, Crown, Unpolished.

	Pounds.	Dollars.
1913	20,458,971	804,732
1914	31,197,531	1,212,536
1915	16,532,210	679,228
1916	1,401,572	140,262
1917	2,594,979	277,222

Glass, Window—Cylinder, Crown and Common, Unpolished When Bent or Decorated.

	Pounds.	Dollars.
1913	1,773,023	153,723
1914	1,703,186	149,203
1915	460,017	56,223
1916	339,009	62,051
1917	370,522	47,069

Glass, Cylinder and Crown, Unpolished, Silvered.

	Pounds.	Dollars.
1914	56,494	3,993
1915	54,393	2,021
1916	12	1
1917	429	46

Not stated prior to 1914.

Glass, Cylinder and Crown, Polished.

	Sq. feet.	Dollars.
1913	579,129	119,395
1914	615,337	121,814
1915	196,274	36,783
1916	108,578	19,893
1917	.....	.....

Glass, Cylinder and Crown, Polished When Bent or Decorated.

	Sq. feet.	Dollars.
1913	247,428	60,260
1914	147,482	36,116
1915	43,385	10,076
1916	6,321	1,383
1917	39	67

Glass, Cylinder and Crown, Polished, Silvered.

	Sq. feet.	Dollars.
1914	90,857	20,405
1915	89,346	19,597
1916	8,798	1,905
1917	.....	.....

Not stated prior to 1914.

Glass, Window — Cylinder and Crown, Polished, Silvered When Ground, Bent or Decorated.

	Sq. feet.	Dollars.
1913	17	23
1914	138,158	33,034
1915	107,711	26,235
1916	20,528	5,087
1917	.....	.....

Glass, Plate, Fluted, Rolled, Ribbed or Rough, or the Same Containing a Wire Netting Within Itself.

	Sq. feet.	Dollars.
1913	379,219	14,812
1914	436,587	15,207
1915	307,616	12,742
1916	69,272	4,826
1917	18,240	2,002

Glass, Plate, Fluted, Rolled, Ribbed or Rough, Ground, Smoothed or Otherwise Obscured.

	Sq. feet.	Dollars.
1913	9,617	2,247
1914	614,012	126,917
1915	4,872	1,074
1916	489	124
1917	5,952	402

Glass, Plate—Cast, Polished, Finished or Unfinished, Unsilvered, or the Same Containing a Wire Netting Within Itself.

	Sq. feet.	Dollars.
1913	1,068,427	247,015
1914	2,819,386	631,596
1915	440,718	100,400
1916	12,782	3,778
1917	13,484	13,787

Glass Plate—Cast, Polished, Unsilvered When Bent or Decorated, Etc.

	Sq. feet.	Dollars.
1913	88,189	47,449
1914	140,806	62,228
1915	27,121	14,561
1916	7,147	2,726
1917	3,334	1,542

Glass, Plate—Cast, Polished, Silvered and L. G. Plates, Exceeding in Size 144 Square Inches.

	Sq. feet.	Dollars.
1913	832	527
1914	18,229	4,883
1915	2,592	904
1916	2,557	515
1917	35	116

Glass, Plate—Cast, Polished, Silvered When Bent or Otherwise Decorated.

	Sq. feet.	Dollars.
1913	1,510	1,004
1914	19,659	5,854
1915	6,822	2,152
1916	2,570	2,135
1917	14	33

Glauber Salts.

	Tons.	Dollars.
1913	240	5,685
1914	228	5,557
1915	53	1,113
1916	1	33
1917	.....	.....

Glazes, Fluxes, Enamels and Colors, Ceramic and Glass.

		Dollars.
1914	.....	38,527
1915	.....	70,782
1916	.....	64,138
1917	.....	43,421

Not stated prior to 1914.

Glucose.

	Pounds.	Dollars.
1913	212,635	7,166
1914	262,223	9,025
1915	62,799	1,880
1916	1,233	313
1917	7,696	331

Glue.

	Pounds.	Dollars.
1913	5,069,661	672,266
1914	22,545,681	1,792,612
1915	8,086,283	702,350
1916	3,050,794	219,177
1917	6,301,825	954,673

Glycerine, Crude.

	Pounds.	Dollars.
1913	34,390,129	4,247,082
1914	36,230,383	4,473,178
1915	18,661,929	2,185,368
1916	10,875,058	2,209,610
1917	4,078,803	1,260,464

Glycerine, Refined.

	Pounds.	Dollars.
1913	432,339	73,396
1914	551,306	90,562
1915	360,567	60,908
1916	303,463	132,469
1917	137,128	76,361

Gold Beaters' Molds and Skins.

		Dollars.
1913	.....	26,408
1914	.....	26,634
1915	.....	13,944
1916	.....	23,131
1917	.....	38,651

Gold Leaf.

	100 leaves.	Dollars.
1913	30,902	28,283
1914	37,527	32,452
1915	13,614	12,549
1916	1,547	773
1917	14,370	12,403

Grape Sugar.

	Pounds.	Dollars.
1913	4,336	598
1914	93	48
1915	361	51
1916	110	62
1917	.....	.....

Grease Enfleurage, Not Containing Alcohol.

	Pounds.	Dollars.
1913	92,446	124,195
1914	40,638	51,417
1915	28,407	31,578
1916	5,245	8,524
1917	26,636	33,945

Grease, Soluble, Used in Processes of Softening, Dyeing or Finishing.

		Dollars.
1913	.....	4,886
1914	.....	4,401
1915	.....	2,360
1916	.....	584
1917	.....	77

Grease, Wool, Crude.

	Pounds.	Dollars.
1913	14,473,551	328,991
1914	12,284,248	292,988
1915	9,281,273	236,705
1916	7,617,713	350,535
1917	4,861,795	294,326

Grease, Wool, Refined.

	Pounds.	Dollars.
1913	2,009,018	86,474
1914	2,691,591	121,847
1915	467,418	23,418
1916	214,599	14,794
1917	316,149	24,819

Grease and Oils, Sulphur Oil or Olive Foots.

	Pounds.	Dollars.
1913	13,693,352	874,114
1914	11,714,795	772,055
1915	12,946,066	885,810
1916	12,684,936	1,055,292
1917	12,138,516	1,108,099

Not separately stated prior to 1913.

Grease and Oils, All Other (Excepting Fish Oils), Used in Soap Making, Etc.

	Pounds.	Dollars.
1913	7,334,605	291,934
1914	10,684,016	449,561
1915	17,300,356	709,330
1916	11,324,635	482,479
1917	8,428,689	482,066

Includes sulphur oil, etc., prior to 1913.

Grease, All Other Not Specially Provided For.

		Dollars.
1913	.....	14,207
1914	.....	106,041
1915	.....	84,764
1916	.....	81,289
1917	.....	23,713

Guano.

	Tons.	Dollars.
1913	16,462	313,891
1914	21,853	754,727
1915	20,950	534,371
1916	20,950	534,371
1917	15,732	425,210
1917	3,563	73,394

Guiacol Carbonate.

	Pounds.	Dollars.
1914	1,637	2,645
1915	6,907	11,125
1916	1,000	1,150
1917	200	6,458

Not stated prior to 1914.

Gum, Aloes.

	Pounds.	Dollars.
1913	909,279	77,958
1914	918,402	64,983
1915	953,186	90,081
1916	1,597,811	152,146
1917	1,236,381	97,607

Gum, Amber and Amberoid, Crude.

	Pounds.	Dollars.
1913	35,646	339,984
1914	22,485	117,375
1915	9,856	103,136
1916	443	3,599
1917	36	324

Gum, Arabic.

	Pounds.	Dollars.
1912	6,596,737	568,631
1913	7,111,354	593,126
1914	2,727,447	182,370

Included in "Arabic or Senegal" after October 3, 1913.

Gum, Arabic or Senegal.

	Pounds.	Dollars.
1914	3,492,682	240,066
1915	5,184,265	402,507
1916	7,617,494	679,928
1917	7,478,234	861,846

Gum, Asafoetida.

	Pounds.	Dollars.
1913	134,579	55,368
1914	106,338	27,193
1915	51,727	12,656
1916	115,856	30,126
1917	107,486	52,877

Gum, Benzoin, Gamboge and Mastic.

	Pounds.	Dollars.
1913	105,967	41,981
1914	41,975	17,386
1915	106,508	42,940
1916	219,266	73,843
1917	170,950	68,305

Gum, Camphor, Crude, Natural.

	Pounds.	Dollars.
1913	3,477,760	979,355
1914	3,476,908	629,725
1915	3,715,387	998,555
1916	4,674,530	1,268,233
1917	6,605,630	1,991,408

Gum, Camphor, Refined.

	Pounds.	Dollars.
1913	463,410	153,020
1914	624,508	201,992
1915	1,140,783	406,587
1916	2,304,197	754,498
1917	4,533,918	2,063,177

Gum, Camphor, Synthetic.

	Pounds.	Dollars.
1915	16	3
1916	.....	.....
1917	469	179

Not stated prior to 1915.

Gum, Chicle.

	Pounds.	Dollars.
1911	5,368,566	2,551,344
1912	5,266,285	2,433,924
1913	6,920,416	3,059,116
*1914	7,998,187	2,902,454

*Under provisions of law of 1909; imported between July 1 and October 3, 1913; stated separately after 1914.

Gum, Chicle, Crude.

	Pounds.	Dollars.
1914	1,080,665	389,717
1915	2,468,400	839,312
1916	2,728,159	915,817
1917	4,435,149	1,467,917

Gum, Chicle, Refined.

	Pounds.	Dollars.
1914	472,766	214,257
1915	1,934,760	962,889
1916	2,302,186	1,283,899
1917	3,935,093	2,371,834

Gum, Copal.

	Pounds.	Dollars.
1914	13,005,925	938,002
1915	12,528,887	813,985
1916	24,100,156	1,440,238
1917	25,621,685	1,588,070

Gum, Copal, Kauri and Damar.

	Pounds.	Dollars.
1912	24,824,399	2,017,737
1913	31,513,330	2,828,840
*1914	9,207,797	989,808

* Under provisions of law of 1909; imported between July 1 and October 3, 1913; stated separately after 1914.

Gum, Damar.

	Pounds.	Dollars.
1914	3,854,698	337,245
1915	5,388,644	563,056
1916	10,819,590	790,776
1917	9,200,064	797,115

Gum, Dextrine, Etc.

	Pounds.	Dollars.
1913	5,096,891	180,296
1914	6,684,556	213,301

Stated separately after 1914.

Gum, Dextrine, Made from Potato Starch or Potato Flour.

	Pounds.	Dollars.
1914	5,226,421	162,688
1915	4,595,949	154,337
1916	720,106	40,552
1917	210,948	17,832

Gum, Dextrine, Dextrine Substitutes, Burnt Starch or British Gum.

	Pounds.	Dollars.
1914	471,491	18,180
1915	274,668	12,028
1916	154,882	10,049
1917	32,773	2,955

Gum, Kauri.

	Pounds.	Dollars.
1914	6,554,887	1,097,989
1915	9,530,267	1,444,315
1916	9,958,953	1,394,527
1917	6,667,474	1,018,582

Gum, Lac, Crude, Seed, Button and Stick.

	Pounds.	Dollars.
1913	293,010	36,832
1914	992,425	143,222
1915	1,126,167	88,203
1916	3,485,975	291,176
1917	5,473,174	637,846

Gum, Rosin, Crude.

	Pounds.	Dollars.
1913	209,983	12,606
1914	2,742,083	58,634
1915	1,505,790	42,085
1916	5,571,325	146,250
1917	129,848	3,380

Gum, Senegal.

	Pounds.	Dollars.
1913	172,528	16,254
*1914	140,097	10,609

* Included in "Arabic or Senegal" after October 3, 1913.

Gum, Shellac.

	Pounds.	Dollars.
1913	22,069,610	3,046,750
1914	16,824,130	2,686,480
1915	24,308,145	3,018,286
1916	25,927,553	3,301,378
1917	32,847,434	7,709,228

Gum, Tragacanth.

	Pounds.	Dollars.
1913	1,401,721	463,809
1914	1,301,545	460,364
1915	1,025,081	355,119
1916	1,129,704	590,123
1917	473,556	320,751

Gum, Tragasol.

	Pounds.	Dollars.
1913	1,028,804	23,998
1914	913,077	20,310
1915	761,390	16,295
1916	931,503	21,587
1917	882,914	21,663

Hemlock Bark Extract for Tanning, Not Containing Alcohol.

	Pounds.	Dollars.
1915	5,263,296	173,998
1916	5,577,989	390,287
1917	.....	.....

Not stated prior to 1915.

Hide Cuttings, Raw, and Other Glue Stock.

		Dollars.
1913	.....	1,773,786
1914	.....	2,126,632
1915	.....	1,504,325
1916	.....	970,313
1917	83,631,932	1,451,819

Quantity not stated prior to 1917.

Honey.

	Gallons.	Dollars.
1913	113,792	64,718
1914	49,163	30,291
1915	258,912	107,172
1916	124,268	53,502
1917	277,345	171,616

Hoofs, Horns, and Parts of, Unmanufactured, Including Horn Strips and Tips.

		Dollars.
1913	.....	320,192
1914	.....	254,872
1915	.....	156,126
1916	.....	110,169
1917	.....	171,718

Hop Extract and Lupulin.

		Dollars.
1913	.....	34,338
1914	.....	49,451
1915	.....	24,407
1916	.....	3,805
1917	.....	1,759

Hops.

	Pounds.	Dollars.
1913	8,471,776	2,843,299
1914	5,360,748	2,775,882
1915	11,710,554	2,738,644
1916	664,284	147,638
1917	212,029	64,701

Ichthyol.

	Pounds.	Dollars.
1913	44,347	61,796
1914	66,957	92,485
1915	51,847	70,664
1916	69,227	59,470
1917	91,884	60,757

Incense.

		Dollars.
1913	.....	14,637
1914	.....	24,382
1915	.....	4,328
1916	.....	5,431
1917	.....	9,968

India Rubber and Substitutes for, Crude; Balata.

	Pounds.	Dollars.
1913	1,318,598	766,772
1914	1,525,351	789,261
1915	2,473,228	963,384
1916	2,549,303	997,827
1917	3,284,533	1,647,906

India Rubber and Substitutes for, Crude; Guayule Gum.

	Pounds.	Dollars.
1913	10,504,945	4,354,400
1914	1,475,804	607,076
1915	5,116,165	1,442,464
1916	2,826,960	881,023
1917	2,872,372	764,484

India Rubber and Substitutes for, Crude; Gutta-Joolatong.

	Pounds.	Dollars.
1913	45,444,252	2,197,948
1914	24,224,955	1,173,335
1915	14,765,765	704,613
1916	28,381,105	1,347,176
1917	21,738,004	1,068,577

India Rubber and Substitutes for, Crude; Gutta Percha.

	Pounds.	Dollars.
1913	1,818,755	271,741
1914	1,552,857	302,623
1915	1,776,851	258,132
1916	2,751,859	327,039
1917	2,044,723	355,572

India Rubber, Crude, and Milk of.

	Pounds.	Dollars.
1913	113,218,678	90,110,606
1914	131,938,593	71,223,667
1915	171,429,176	82,812,928
1916	268,110,692	156,112,208
1917	332,911,448	190,201,904

India Rubber, Scrap, or Refuse.

	Pounds.	Dollars.
1913	44,479,429	5,675,824
1914	21,223,461	1,617,789
1915	10,594,494	827,778
1916	13,963,782	932,644
1917	17,665,403	1,187,113

India Rubber, Reclaimed.

	Pounds.	Dollars.
1914	4,767,914	443,291
1915	919,628	112,220
1916	2,236,867	330,979
1917	2,837,230	407,745

Not stated prior to 1914.

Indigo, Carmined.

	Pounds.	Dollars.
1912	9,047	5,903
1913	16,329	9,986
1914	2,130	1,333

Not stated after October 3, 1913.

Indigo, Crude, Natural, or Synthetic.

	Pounds.	Dollars.
1913	7,712,488	1,102,893
1914	8,252,528	1,115,128
1915	7,983,112	1,604,767
1916	6,794,518	8,451,501
1917	*545,105	960,038

* Figures cover period July 1 to September 8, 1916; stated separately afterward.

Indigo, Natural.

	Pounds.	Dollars.
1917	1,231,986	2,449,361

Indigo, Synthetic.

	Pounds.	Dollars.
1917	886,700	559,156

Indigo, Dyes Obtained From.

		Dollars.
1914	.....	84,842
1915	.....	76,258
1916	.....	155,264
1917	.....	147,744

Not stated prior to 1914.

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Citric Acid Powdered . . . " " "
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Tannin	Ferric Oxalate Scales

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WORKS AND LABORATORIES, BOROUGH OF BROOKLYN, NEW YORK

Indigo, Extracts or Pastes.

	Pounds.	Dollars.
1912	223,687	45,984
1913	242,998	43,417
1914	11,998	2,540

Not stated after October 3, 1913.

Ink, Printers'.

		Dollars.
1913	.....	7,820
1914	.....	24,999
1915	.....	15,022
1916	.....	17,884
1917	.....	19,026

Ink, Writing and Copying.

		Dollars.
1913	.....	28,518
1914	.....	18,941
1915	.....	22,765
1916	.....	21,961
1917	.....	26,400

Ink, All Other, Including Ink Powders.

		Dollars.
1913	.....	4,918
1914	.....	6,951
1915	.....	6,196
1916	.....	3,491
1917	.....	5,095

Insulating Compounds.

		Dollars.
1913	.....	3,080
1914	.....	117
1915	.....	1,192
1916	.....	8,871
1917	.....	8,003

Iodine, Crude.

	Pounds.	Dollars.
1913	351,256	739,734
1914	230,591	533,447
1915	631,510	1,284,395
1916	1,044,525	2,447,764
1917	1,726,903	4,381,317

Iodine, Resublimed.

	Pounds.	Dollars.
1913	40	96
1914	57	205
1915	3	7
1916	.....	.....
1917	2,610	9,088

Iodoform.

	Pounds.	Dollars.
1913	10	57
1914	86½	301
1915	10	40
1916	.....	.....
1917	.....	.....

Ipecac.

	Pounds.	Dollars.
1913	54,945	86,118
1914	78,654	110,316
1915	137,927	248,408
1916	203,734	484,828
1917	84,672	146,506

Iridium.

	Ounces, troy.	Dollars.
1913	5,341	348,333
1914	2,185	154,842
1915	3,801	220,823
1916	2,496	146,055
1917	3,899	355,206

Iron in Pigs.

	Tons.	Dollars.
1913	155,900	6,418,582
1914	137,192	4,891,310
1915	103,996	4,218,964
1916	117,357	7,418,340
1917	118,241	10,942,354

Isinglass and Prepared Fish Sounds.

	Pounds.	Dollars.
1913	225,165	72,540
1914	146,364	66,433
1915	11,906	9,008
1916	13,750	14,498
1917	35,723	35,476

Jalap.

	Pounds.	Dollars.
1913	227,275	44,632
1914	208,901	23,942
1915	176,047	18,485
1916	201,383	13,642
1917	168,639	14,315

Kainite.

	Tons.	Dollars.
1913	366,184	2,149,689
1914	526,112	2,579,619
1915	79,124	444,906
1916	64	1,795
1917	.....	.....

Lac, Dye.

	Pounds.	Dollars.
1913	.....	.....
1914	.....	.....
1915	.....	.....
1916	89,600	13,804
1917	.....	.....

Lactarene, or Casein.

	Pounds.	Dollars.
1913	8,806,939	651,062
1914	10,799,351	705,305
1915	7,919,742	496,897
1916	10,376,641	984,899
1917	12,319,111	1,843,492

Lakes, Dry or in Pulp, Not Specially Provided For.

		Dollars.
1914	.....	59,603
1915	.....	153,430
1916	.....	29,839
1917	.....	11,230

Not stated prior to 1914.

Lanolin.

	Pounds.	Dollars.
1913	.....	.....
1914	91,477	9,622
1915	89,583	10,448
1916	13,342	6,353
1917	710	267

Lard.

	Pounds.	Dollars.
1912	4,427	583
1913	4,117	486
1914	1,251	169

Included in next class after October 3, 1913.

Lard, Lard Compounds and Lard Substitutes.

	Pounds.	Dollars.
1914	124,385	13,665
1915	729,792	79,632
1916	2,405	289
1917	66,682	7,522

Lead, Acetate of—Brown, Gray or Yellow.

	Pounds.	Dollars.
1913	42	8
1914	17,477	957
1915	.....	.....
1916	124	17
1917	925	97

Lead, Acetate, White.

	Pounds.	Dollars.
1913	21,599	1,177
1914	110,936	10,765
1915	31,096	1,809
1916	.....	.....
1917	.....	.....

Lead, Nitrate.

	Pounds.	Dollars.
1913	11,305	605
1914	11,512	712
1915	.....	.....
1916	2,205	280
1917	224	22

Lead Compounds, Not Elsewhere Specified.

	Pounds.	Dollars.
1914	102,889	9,348
1915	86,514	7,471
1916	39,823	3,044
1917	32,987	3,069

Lead, Pigs and Bars, Old Refuse Run Into Bars, Etc.

	Pounds.	Dollars.
1913	9,905,780	147,538
1914	1,309,204	36,307
1915	951,999	31,385
1916	1,794,889	90,815
1917	6,369,189	323,951

Lead Pipes, Shot, Glaziers' Lead and Lead Wire.

	Pounds.	Dollars.
1913	33,736	2,404
1914	64,964	4,611
1915	24,042	1,687
1916	193,775	16,436
1917	644	155

Leeches.

		Dollars.
1913	.....	5,587
1914	.....	7,376
1915	.....	1,534
1916	.....	2,810
1917	.....	16,899

Lemon, Lime and Sour Orange Juice.

		Dollars.
1913	.....	116,370
1914	.....	110,860
1915	.....	139,905
1916	.....	152,575
1917	.....	180,086

Licorice, Extract of, in Paste, Rolls or Other Forms.

	Pounds.	Dollars.
1913	832,277	106,288
1914	946,016	122,216
1915	1,080,718	152,756
1916	1,702,927	230,129
1917	1,156,300	263,671

Licorice Root.

	Pounds.	Dollars.
1913	105,032,429	1,806,756
1914	86,754,245	1,526,067
1915	82,286,110	1,557,443
1916	52,784,042	1,792,573
1917	59,398,644	2,189,441

Lime.

	100 Pounds.	Dollars.
1913	77,319	42,539
1914	65,036	42,926
1915	66,634	29,518
1916	92,321	42,537
1917	160,776	74,437

Lime, Chloride, or Bleaching Powder.

	Pounds.	Dollars.
1913	76,092,327	619,402
1914	45,497,239	416,893
1915	18,402,130	197,975
1916	3,289,790	80,418
1917	65,564	3,888

Lime, Citrate.

	Pounds.	Dollars.
1913	5,526,954	756,309
1914	3,119,924	496,517
1915	6,242,244	1,102,629
1916	8,127,364	1,763,652
1917	6,361,458	1,554,577

Litharge.

	Pounds.	Dollars.
1913	34,022	1,649
1914	43,156	2,355
1915	14,779	774
1916	20,160	1,417
1917	220	42

Lithopone.

	Pounds.	Dollars.
1914	7,245,151	218,133
1915	6,185,245	195,828
1916	5,122,083	414,573
1917	231,869	20,591

Not separately stated prior to 1914.

Litmus.

		Dollars.
1913	.....	216
1914	.....	263
1915	.....	59
1916	.....	280
1917	.....	648

Logwood.

	Tons.	Dollars.
1913	36,952	475,484
1914	30,172	379,754
1915	54,704	722,410
1916	134,819	3,437,388
1917	121,762	4,127,031

Logwood and Other Dyewood Extracts.

	Pounds.	Dollars.
1913	2,258,206	111,575
1914	1,228,178	77,119
1915	2,061,368	144,207
1916	2,652,787	316,372
1917	1,147,448	164,711

Mace, Unground.

	Pounds.	Dollars.
1913	611,005	244,177
1914	287,976	112,178
1915	342,618	124,128
1916	426,096	130,796
1917	436,346	145,126

Mace, Bombay, or Wild, Unground.

	Pounds.	Dollars.
1915	5,714	771
1916	22,400	6,720
1917	40,984	4,090

Not stated prior to 1915.

Madder, or Munjeet, or Indian Madder, Ground or Prepared.

	Pounds.	Dollars.
1913	30,602	2,806
1914	47,068	3,817
1915	29,327	3,524
1916	68,381	9,087
1917	78,852	12,472

Magnesia, Calcined.

	Pounds.	Dollars.
1913	72,579	12,592
1914	109,396	15,118
1915	145,806	16,012
1916	46,008	7,560
1917	56,656	17,575

Magnesia, Carbonate of, Precipitated.

	Pounds.	Dollars.
1913	77,190	3,811
1914	58,683	3,972
1915	49,731	2,554
1916	19,888	1,414
1917	25,092	5,077

Magnesia, Sulphate of, or Epsom Salts.

	Pounds.	Dollars.
1913	9,345,099	35,739
1914	13,560,599	43,742
1915	7,005,598	32,862
1916	1,456,254	8,503
1917	54,200	875

Magnesite, Crude.

	Pounds.	Dollars.
1913	33,654,260	111,276
1914	21,590,605	46,611
1915	37,463,509	80,625
1916	101,591,459	281,620
1917	179,292,638	748,951

Magnesite, Calcined.

	Pounds.	Dollars.
1913	345,322,155	1,731,443
1914	288,989,577	1,485,273
1915	125,886,407	751,766
1916	32,312,610	282,758
1917	9,448,817	182,037

Malt, Barley.

	Bushels.	Dollars.
1913	10,131	14,612
1914	11,807	16,085
1915	5,137	6,334
1916	274	413
1917	1,770	2,584

Malt Extract, Fluid, in Bottles or Jugs.

	Gallons.	Dollars.
1913	1,405	2,376
1914	1,284	2,087
1915	318	589
1916	64	92
1917	516	485

Malt Extract, Fluid, in Casks.

	Gallons.	Dollars
1913	9,191	9,661
1914	10,333	10,050
1915	4,124	3,951
1916	2,488	2,313
1917	10,783	10,606

Malt Extract, Solid or Condensed.

		Dollars
1913	.....	338
1914	.....	767
1915	.....	7,006
1916	.....	11,834
1917	.....	71

Manganese, Oxide and Ore of.

	Tons.	Dollars.
1913	407,169	2,195,566
1914	288,837	1,941,472
1915	206,913	1,494,905
1916	492,967	5,358,067
1917	656,026	10,542,572

Manna.

	Pounds.	Dollars.
1913	30,869	16,303
1914	88,240	32,848
1915	36,833	12,276
1916	68,447	32,434
1917	75,336	48,613

Manure Salts, Including Double Manure Salts, Not Specially Provided For.

	Tons.	Dollars.
1913	172,557	1,798,773
1914	260,977	2,757,013
1915	66,411	757,151
1916	2,278	42,868
1917	324	7,794

Marshmallow or Althea Flowers or Leaves.

	Pounds.	Dollars.
1913	561	27
1914	.....	.....
1915	4,695	245
1916	8,161	1,126
1917	21,713	2,033

Mashmallow or Althea Roots, Crude.

	Pounds.	Dollars.
1913	4,270	538
1914	6,049	514
1915	6,645	1,209
1916	7,242	1,926
1917	23,120	5,846

Meat Extracts, Fluid.

	Pounds.	Dollars.
1913	29,091	11,096
1914	3,768	3,956
1915	3,733	4,423
1916	172	264
1917	1,990	3,632

Meat Extracts, All Other.

	Pounds.	Dollars.
1913	106,813	138,489
1914	130,672	198,187
1915	97,656	139,936
1916	78,614	100,652
1917	93,108	155,766

Meerschaum, Crude or Unmanufactured.

		Dollars.
1913	.....	119,457
1914	.....	102,808
1915	.....	18,956
1916	.....	.....
1917	.....	671

Menthol.

	Pounds.	Dollars.
1913	49,896	289,058
1914	127,924	408,954
1915	111,020	236,759
1916	145,203	360,589
1917	172,767	398,191

Mica, Ground.

	Pounds.	Dollars.
1913	577,061	6,592
1914	461,803	4,002
1915	378,768	4,143
1916	436,067	4,302
1917	152,963	1,584

Milk, Sugar of.

	Pounds.	Dollars.
1913	9,026	2,582
1914	578,727	67,901
1915	250,212	28,154
1916	22,400	3,101
1917	.....	.....

Mineral Salts Obtained by Evaporation from Mineral Waters.

	Punds.	Dollars.
1913	103,337	35,420
1914	82,569	40,840
1915	10,757	9,642
1916	425	213
1917	626	312

Monozite Sand and Thorite.

	Pounds.	Dollars.
1913	1,145,010	94,425
1914	170,792	12,984
1915	1,493,028	133,819
1916	2,468,146	191,576
1917	4,020,023	263,331

Morphia, or Morphine, Sulphate of.

	Ounces.	Dollars.
1913	24,797	141,221
1914	5,805	14,220
1915	1,383	3,300
1916	2,685	8,906
1917	5,584	22,675

Mustard, Ground or Prepared, in Bottles or Otherwise.

	Pounds.	Dollars.
1913	1,433,118	383,710
1914	1,927,686	519,333
1915	1,089,400	293,444
1916	1,836,402	554,380
1917	1,080,971	395,162

Musk, in Grain.

		Dollars.
1913	.....	7,699
1914	.....	3,991
1915	.....	665
1916	.....	534
1917	.....	63,304

Musk, in Pods.

	Ounces.	Dollars.
1913	12,994	124,855
1914	3,331	30,378
1915	10,115	65,882
1916	7,390	62,094
1917	12,415	80,036

Myrabolans Fruit.

	Pounds.	Dollars.
1913	19,735,724	195,264
1914	24,256,373	438,672
1915	18,417,434	198,347
1916	25,612,705	375,401
1917	16,087,463	421,824

Naphthalin, Phenol and Cresol.

		Dollars.
1914	.....	195,713
1915	.....	233,458
1916	.....	518,140
1917	.....	164,324

Not stated prior to 1914.

Nickel Oxide.

	Pounds.	Dollars.
1913	1,124	398
1914	2,720	1,245
1915	1,071	505
1916	497	130
1917	21,488	6,478

Nuts and Nutgalls for Dyeing and Tanning.

		Dollars.
1913	.....	126,435
1914	.....	177,788
1915	.....	137,972
1916	.....	420,030
1917	.....	214,953

Nutgall, Extract.

	Pounds.	Dollars.
1913	145,919	18,228
1914	205,130	25,017
1915	157,084	23,262
1916	61,055	11,444
1917	45,760	9,997

Nutmegs, Unground.

	Pounds.	Dollars.
1913	3,456,339	368,984
1914	1,755,653	184,779
1915	2,879,986	283,861
1916	3,590,959	420,503
1917	4,201,872	661,012

Nux Vomica.

	Pounds.	Dollars.
1913	2,306,735	39,380
1914	1,891,072	32,983
1915	2,246,338	51,507
1916	4,355,964	134,366
1917	2,445,984	86,018

Oakum.

	Pounds.	Dollars.
1913	1,326,876	64,851
1914	1,384,439	94,796
1915	1,509,155	78,079
1916	1,233,964	78,193
1917	797,290	87,226

Oak Extract for Tanning, Not Containing Alcohol.

	Pounds.	Dollars.
1914	143,094	6,539
1915	66,293	2,628
1916	.....	.....
1917	.....	.....

Not stated prior to 1914.

*Ocher, Ground in Oil or Water.

	Pounds.	Dollars.
1912	16,346	901
1913	16,988	970

*Included in "Ocher and Ochery Earths" after 1913.

Ocher and Ochery Earths.

	Pounds.	Dollars.
1913	17,588,272	162,397
1914	21,041,976	154,547
1915	17,430,128	124,359
1916	18,049,376	153,880
1917	17,573,109	213,272

Oilcake, Cocoanut.

	Pounds.	Dollars.
1917	29,867	400

Not stated prior to 1917.

Oilcake, Cottonseed.

	Pounds.	Dollars.
1913	400,686	3,322
1914	5,744,090	53,214
1915	1,743,113	15,706
1916	10,289,336	108,413
1917	34,281,702	372,812

Oilcake, Corn.

	Pounds.	Dollars.
1913	102,700	1,283
1914	91,700	1,227
1915	37,500	562
1916	10,900	191
1917	15,200	324

"Quality Acids and Chemicals"

ACIDS

Sulphuric, Commercial and C. P. (Made from Brimstone)
Electrolyte, For Storage Batteries
Nitric, Commercial and C. P.
Muriatic, Commercial and C. P.
Mixed
Acetic

ALUMS

Paper Makers'
Filter
Ammonia
Sulphate of Alumina
Sodic Aluminic Sulphate (S.A.S.)

SULPHATE OF SODA

Glauber's Salt, Neutral Crystals
Calcined
Pure, Anhydrous, For Standardizing Aniline Dyes
Glass-Makers' Salt Cake
Nitre Cake, Bisulphate of Soda

MISCELLANEOUS

Aqua Ammonia
Chloride of Alumina
Per Chloride of Iron
Manganate of Soda
Nitrate of Mercury
Nitrate of Iron
Nitrate of Lead
Lacquers and Thinners
Permanganate of Soda
Casein
China Clay
Satin White
Etc., etc., etc.

THE KALBFLEISCH CORPORATION, 31 UNION SQUARE WEST NEW YORK

BROOKLYN, N.Y. WATERBURY, CONN. ELIZABETHPORT, N.J. ERIE, PA. CHATTANOOGA, TENN.
PROVIDENCE, R.I. NEWARK, N.J. PATERSON, N.J. DANBURY, CONN.

Oilcake, Cottonseed and Linseed (Bibby's).

	Pounds.	Dollars.
1913	2,571,694	37,455
1914	2,406,035	24,332
1915	2,996,201	38,238
1916	10,819,746	129,843
1917	6,570,668	82,898

Oilcake, Rapeseed.

	Pounds.	Dollars.
1913	.....	.....
1914	.....	.....
1915	47,278	11,204
1916	4,125	75
1917	2,000	26

Oilcake, Soya Bean.

	Pounds.	Dollars.
1913	7,004,903	93,002
1914	3,163,260	38,255
1915	5,975,592	64,307
1916	10,468,001	103,081
1917	11,760,936	136,064

Oilcake, All Other Bean.

	Pounds.	Dollars.
1913	579,794	5,914
1914	142,876	1,685
1915	724,072	13,035
1916	4,802,119	53,173
1917	895,079	11,400

Oil, Alazarine, Assistant.

	Gallons.	Dollars.
1913	137,187	62,923
1914	186,234	72,430
1915	48,376	18,820
1916	7,382	4,134
1917	5,193	3,010

Oil, Almond, Bitter.

	Pounds.	Dollars.
1913	10,442	25,629
1914	7,525	21,954
1915	2,711	9,184
1916	3,602	18,400
1917	4,128	27,751

Oil, Almond, Sweet.

	Pounds.	Dollars.
1913	152,300	63,583
1914	52,550	22,777
1915	43,321	23,495
1916	68,838	36,400
1917	38,939	23,431

Oil, Amber.

	Pounds.	Dollars.
1913	18,707	1,027
1914	15,648	1,058
1915	2,720	239
1916	674	250
1917	7,580	2,932

Oil, Animal, Rendered and Combinations, Not Specially Provided For.

	Gallons.	Dollars.
1913	4,030	2,022
1914	115,871	23,527
1915	140,815	30,464
1916	93,135	31,985
1917	56,915	40,243

Oil, Anise, or Anise Seed.

	Pounds.	Dollars.
1913	127,501	173,078
1914	42,672	55,602
1915	117,188	119,972
1916	206,609	156,411
1917	266,686	150,849

Oil, Bergamot.

	Pounds.	Dollars.
1913	64,259	310,635
1914	38,647	148,753
1915	58,621	157,519
1916	69,440	178,300
1917	50,654	179,182

Oil, Birch Tar.

	Pounds.	Dollars.
1914	40,123	1,898
1915	12,098	571
1916	47,767	3,183
1917	24,073	3,717

Not stated prior to 1914.

Oil, Cajeput.

	Pounds.	Dollars.
1913	9,143	3,224
1914	14,110	4,757
1915	19,243	6,999
1916	96,626	18,992
1917	79,585	29,585

Oil, Camomile.

	Pounds.	Dollars.
1913	4½	88
1914	12	247
1915	3	67
1916	.....	.....
1917	.....	.....

Oil, Camphor.

	Pounds.	Dollars.
1913	.....	.....
1914	18,874	3,160
1915	68	12
1916	8,333	5,708
1917	224	899

Oil, Caraway.

	Pounds.	Dollars.
1913	10,107	10,453
1914	3,669	5,063
1915	18,107	20,730
1916	15,567	23,536
1917	3,723	4,208

Oil, Cassia and Cinnamon.

	Pounds.	Dollars.
1913	123,645	97,438
1914	79,155	49,528
1915	54,962	34,411
1916	121,034	85,974
1917	153,244	130,112

Oil, Castor.

	Gallons.	Dollars.
1913	5,241	6,396
1914	189,583	88,053
1915	63,005	29,206
1916	253,077	223,130
1917	323,703	286,068

Oil, Cedrat.

	Pounds.	Dollars.
1913	115	555
1914	159	770
1915	788	3,721
1916	438	1,966
1917	.....	.....

Oil, Chinese Nut.

	Gallons.	Dollars.
1913	6,004,045	2,738,000
1914	4,878,764	1,960,426
1915	4,723,584	1,640,270
1916	4,968,262	1,977,823
1917	6,846,631	4,046,132

Oil, Citronella and Lemongrass.

	Pounds.	Dollars.
1913	885,486	287,549
1914	702,516	263,149
1915	865,376	307,676
1916	1,054,211	387,631
1917	1,082,035	445,732

Oil, Civet.

	Ounces.	Dollars.
1913	1,155	1,688
1914	250	392
1915	5,181	7,365
1916	.....	.....
1917	.....	.....

Oil, Cocoanut, Not Refined or Deodorized.

	Pounds.	Dollars.
1913	50,493,358	4,182,654
1914	74,588,195	6,726,107
1915	63,249,424	5,430,581
1916	66,574,349	6,052,225
1917	79,359,009	9,141,536

Oil, Cod.

	Gallons.	Dollars.
1913	466,494	135,969
1914	1,091,246	332,092
1915	1,372,413	433,142
1916	1,578,227	678,327
1917	1,163,566	728,804

Oil, Codliver.

	Gallons.	Dollars.
1913	262,516	137,872
1914	371,567	262,927
1915	264,630	157,090
1916	170,876	334,006
1917	205,557	659,192

Oil, Cottonseed.

	Pounds.	Dollars.
1913	3,383,906	185,396
1914	17,510,918	1,046,703
1915	15,162,360	728,961
1916	17,516,391	924,654
1917	12,961,339	985,616

Oil, Creosote, or Dead.

	Gallons.	Dollars.
1913	63,997,602	3,711,328
1914	59,271,677	3,522,919
1915	37,352,340	2,541,845
1916	40,496,987	3,206,780
1917	29,066,915	2,183,859

Oil, Croton.

	Pounds.	Dollars.
1913	4,873	4,414
1914	6,186	5,649
1915	4,010	3,851
1916	.....	.....
1917	500	503

Oil, Eucalyptus.

	Pounds.	Dollars.
1913	31,047	7,206
1914	68,053	21,079
1915	99,218	27,095
1916	110,736	29,993
1917	230,035	83,111

Oil, Fennel.

	Pounds.	Dollars.
1913	5,702	4,160
1914	4,078	2,416
1915	409	441
1916	610	789
1917	.....	.....

Oil, Fish (Not Specially Provided For), Including Sod Oil.

	Gallons.	Dollars.
1913	519,121	152,803
1914	517,562	154,775
1915	439,741	108,739
1916	720,033	235,536
1917	2,280,013	863,050

Oil, Fusel or Amylic Alcohol.

	Pounds.	Dollars.
1913	5,116,660	1,183,872
1914	5,679,801	888,869
1915	3,298,228	699,512
1916	2,162,617	695,196
1917	1,614,507	629,414

Oil, Hempseed.

	Gallons.	Dollars.
1914	375	123
1915	.....	.....
1916	10	5
1917	.....	.....

Oil, Jasmine.

	Pounds.	Dollars.
1913	3,416	39,554
1914	611	14,360
1915	261	5,160
1916	978	27,592
1917	348	8,366

Oil, Juniper.

	Pounds.	Dollars.
1913	17,356	13,037
1914	14,545	8,691
1915	10,388	7,637
1916	975	1,988
1917	4,661	21,514

Oil, Lavender, and Aspic or Spike Lavender.

	Pounds.	Dollars.
1913	227,013	482,779
1914	64,541	100,431
1915	72,989	133,375
1916	198,205	271,815
1917	144,663	237,081

Oil, Lemon.

	Pounds.	Dollars.
1913	410,003	794,215
1914	329,440	752,714
1915	561,387	630,338
1916	435,030	360,862
1917	557,288	459,179

Oil, Limes.

	Pounds.	Dollars.
1913	13,075	15,025
1914	16,559	23,828
1915	9,154	9,279
1916	19,765	29,694
1917	26,551	40,001

Oil, Linseed or Flaxseed, Raw, Boiled or Oxidized.

	Gallons.	Dollars.
1913	172,522	110,840
1914	187,933	91,544
1915	537,810	240,611
1916	56,899	36,399
1917	110,809	76,530

Oil, Mace.

	Pounds.	Dollars.
1913	5,737	2,611
1914	2,652	1,380
1915	4,776	2,605
1916	3,400	2,224
1917	3,000	2,414

Oil, Neroli, or Orange Flower.

	Pounds.	Dollars.
1913	38,365	171,932
1914	15,928	73,265
1915	13,251	31,478
1916	34,447	66,768
1917	23,639	66,354

Oil, Olive (for Manufacturing Purposes Only).

	Gallons.	Dollars.
1913	725,100	483,329
1914	799,260	503,093
1915	717,361	498,889
1916	919,633	711,468
1917	787,348	736,520

Oil, Olive, Edible.

	Gallons.	Dollars.
1913	4,772,775	6,227,526
1914	6,391,827	8,201,331
1915	6,622,246	8,119,512
1916	6,924,606	9,324,361
1917	7,707,094	10,769,754

Oil, Orange.

	Pounds.	Dollars.
1913	77,797	155,299
1914	104,491	222,118
1915	97,014	140,246
1916	97,359	134,025
1917	170,722	322,373

Oil, Origanum, Red or White.

	Pounds.	Dollars.
1913	8,822	8,502
1914	507	630
1915	14,349	15,111
1916	24,222	24,291
1917	54,671	45,859

Oil, Palm.

	Pounds.	Dollars.
1913	48,442,662	3,368,815
1914	61,763,482	4,118,077
1915	31,482,292	2,024,827
1916	40,621,318	2,918,523
1917	36,074,059	2,816,417

Oil, Palm Kernel.

	Pounds.	Dollars.
1913	23,570,152	1,850,270
1914	30,588,958	2,826,972
1915	4,908,702	446,979
1916	6,273,340	479,738
1917	1,857,038	197,237

Oil, Paraffin.

	Gallons.	Dollars.
1913	116,192	35,193
1914	167,384	55,923
1915	60,412	11,609
1916	74,250	149,625
1917	409,746	40,710

Oil, Peanut.

	Gallons.	Dollars.
1913	1,221,676	820,359
1914	1,332,108	915,439
1915	830,638	565,747
1916	1,466,043	824,327
1917	3,018,468	2,028,096

Oil, Peppermint.

	Pounds.	Dollars.
1913	3,525	13,097
1914	18,794	41,367
1915	9,200	8,959
1916	17,066	12,573
1917	23,159	37,734

Oil, Perilla.

	Pounds.	Dollars.
1914	117,893	6,090
1915	69,174	5,485
1916	65,509	5,504
1917	442,619	39,276

Not stated prior to 1914.

Oil, Poppy Seed, Raw, Boiled or Oxidized.

	Gallons.	Dollars.
1913	9,605	7,788
1914	7,973	6,422
1915	11,045	7,072
1916	6,337	6,816
1917	2,789	3,734

Oil, Rapeseed.

	Gallons.	Dollars.
1913	1,564,659	784,750
1914	1,463,099	704,747
1915	1,491,999	784,235
1916	2,534,679	1,414,022
1917	1,095,391	651,314

Oil, Rosemary, or Anthross.

	Pounds.	Dollars.
1913	284,144	100,930
1914	85,243	30,177
1915	93,663	44,636
1916	95,815	30,544
1917	228,080	71,035

Oil, Roses, Attar of.

	Ounces	Dollars.
1913	133,325	791,370
1914	40,454	301,000
1915	60,011	252,592
1916	40,887	169,744
1917	11,235	85,673

Oil, Seal.

	Gallons.	Dollars.
1913	8,972	8,131
1914	179,734	64,963
1915	479,571	166,856
1916	510,062	271,979
1917	518,057	301,138

Oil, Sesame, or Sessamum Seed.

	Pounds.	Dollars.
1913	1,936,647	158,442
1914	1,389,649	118,075
1915	341,545	28,653
1916	257,874	22,293
1917	76,057	11,874

Oil, Soya Bean.

	Pounds.	Dollars.
1913	12,440,406	635,882
1914	16,363,645	830,870
1915	19,210,028	901,643
1916	98,171,275	5,131,582
1917	162,734,010	11,410,606

Oil, Thyme.

	Pounds.	Dollars.
1913	138,972	105,296
1914	89,148	63,864
1915	99,580	88,498
1916	92,097	85,913
1917	91,163	90,868

Oil, Valerian.

	Pounds.	Dollars.
1913	40	124
1914	6	12
1915	15	36
1916	.....	.....
1917	.....	.....

Oil, Whale (Includes Sperm Oil Prior to October 3, 1913).

	Gallons.	Dollars.
1912	895,192	254,430
1913	1,166,339	278,208
*1914	82,756	26,553

*July 1 to October 3, 1913. Stated separately after October 3, 1913.

Oil, Whale, Sperm.

	Gallons.	Dollars.
1914	157,142	66,652
1915	92,033	38,612
1916	59,816	25,191
1917	48,178	37,512

Oil, Whale, All Other.

	Gallons.	Dollars.
1914	290,745	94,424
1915	604,503	215,644
1916	230,762	79,569
1917	415,163	234,097

Oleo Stearin.

	Pounds.	Dollars.
1913	9,540,347	967,000
1914	5,679,535	497,973
1915	2,644,460	226,661
1916	910,478	81,280
1917	1,113,277	114,940

Opium, Aqueous Extract of, and Tinctures of, as Laudanum.

		Dollars.
1913	.....	671
1914	.....	5,279
1915	.....	5,562
1916	.....	6
1917	.....	222

Opium, Crude, or Unmanufactured, Not Adulterated.

	Pounds.	Dollars.
1913	441,277	2,130,154
1914	441,621	1,731,589
1915	353,006	1,699,217
1916	117,870	633,183
1917	43,016	330,652

Opium, Dried, Powdered, or Otherwise Advanced.

	Pounds.	Dollars.
1913	49,071	389,864
1914	32,095	205,684
1915	38,977	308,928
1916	44,052	243,790
1917	77,990	640,563

Opium Salts and Other Alkaloids of, Not Specially Provided For.

	Ounces.	Dollars.
1913	9,672	28,587
1914	11,593	64,528
1915	8,626	49,584
1916	2,360	9,981
1917	34,179	165,028

Orange Mineral.

	Pounds.	Dollars.
1913	287,535	18,595
1914	362,963	24,892
1915	166,202	12,279
1916	108,275	10,589
1917	54,834	7,852

Orchil, or Orchil Liquid.

		Dollars.
1913	.....	27,386
1914	.....	21,569
1915	.....	37,802
1916	.....	114,608
1917	.....	98,905

Orris, or Iris, Root.

	Pounds.	Dollars.
1913	357,963	37,326
1914	580,484	71,941
1915	554,125	52,893
1916	602,289	62,552
1917	527,539	61,494

Osmiridium.

	Ounces, troy.	Dollars.
1914	666	43,659
1915	911	58,014
1916	302	9,654
1917	333	24,293

Not stated prior to 1914.

Palladium.

	Ounces, troy.	Dollars.
1913	9,577	401,707
1914	3,986	169,171
1915	40	2,779
1916	8,011	304,559
1917	1,663	95,331

Papers, Filtering and Crepe.

	Pounds.	Dollars.
1913	665,136	116,582
1914	984,597	344,538
1915	875,497	114,390
1916	672,402	128,805
1917	529,541	216,306

Papers, Greaseproof and Imitation Parchment.

	Pounds.	Dollars.
1914	4,011,250	205,797
1915	3,907,097	200,103
1916	687,009	45,977
1917	697,562	70,493

Not separately stated prior to 1914.

Paraffin.

(Not including oil.)

	Pounds.	Dollars.
1913	11,521,205	503,802
1914	7,501,463	327,402
1915	5,628,811	254,389
1916	8,526,929	418,362
1917	10,641,404	654,186

Paris Green and London Purple.

	Pounds.	Dollars.
1913	165,820	7,692
1914	33,373	3,572
1915	16,800	2,975
1916	31,917	8,163
1917	.....	.....

Pearl Hardening for Paper Makers' Use.

		Dollars.
1913	.....	8,612
1914	.....	5,294
1915	.....	3,609
1916	.....	593
1917	.....	183

Pepper, Black or White, Unground.

	Pounds.	Dollars.
1913	27,568,317	2,855,164
1914	21,809,875	2,179,995
1915	26,620,992	2,685,522
1916	32,174,546	3,789,466
1917	26,586,256	4,035,410

Pepper, Cayenne, Capsicum or Red Pepper, Ground or Unground.

	Pounds.	Dollars.
1913	4,022,755	412,823
*1914	984,716	130,076

* Figures are for July 1 to October 3, 1913. Stated separately after October 3, 1913.

Pepper, Capsicum, Red or Cayenne, Unground.

	Pounds.	Dollars.
1914	6,522,463	711,966
1915	3,093,232	332,616
1916	4,354,041	477,044
1917	4,734,381	47,343

Service

in the fullest sense of the word is the first aim of every branch of our organization

Manufacturing Facilities Five fully equipped plants in New Jersey, together with our plants in Massachusetts, Illinois and Nova Scotia, supply us with the bulk of our products. All materials are tested by competent chemists. We are sole selling agents for the products of several other factories.

Branches and Warehouses For the greater convenience of customers, and the more prompt attention to orders, we have branches and warehouses at strategic distributing centers. Customers are assured the same careful attention at any of our branches as at our main offices in New York City.

Heavy Chemicals We handle a full line of industrial chemicals of the highest quality. Among our specialties are: Caustic Potash and Soda (solid and liquid), Barium Nitrate, Blanc Fixe, Potassium Nitrate, Ammonium Nitrate, Acids, Sodium Nitrite, Soda Ash.

Coal Tar Intermediates We furnish an extensive line of the highest grade intermediates, including Nitro-Benzol, Dinitro-Benzol, Aniline Oil, Aniline Salt, H Acid, Sodium Naphthionate, Acid Sulphanilic, Alpha-Naphthol, Alpha-Naphthylamine, Beta-Naphthol, Beta-Naphthylamine, Schaeffer Salt, R Salt, Benzidine Base, Benzidine Sulphate, Paranitraniline, Toluol, Nitro-Toluol, Toluidine Mixture, Ortho-Toluidine, Para-Toluidine, Xylidine.

Aniline Colors We are constantly adding to our line of Acid, Basic, Chrome and Direct Colors. These colors are standard products, and, class for class, are equal in all respects to pre-war colors. Samples and quotations will be gladly furnished on request. **Our laboratories are always at the service of customers for consultation on color problems.**

Paint and Varnish Materials The demand upon us for these materials has so greatly increased that we have found it necessary to establish a separate department for the paint and varnish trade. Our colors for this trade (soluble in oils, spirits and water) have been pronounced equal to the best in the market. We are direct importers of Chinawood and Soya Bean Oils of guaranteed purity.

Oils and Greases We have now been for many years among the very largest dealers in industrial oils and greases. We sell all kinds of fish, animal and vegetable oils. We handle all kinds of Sulphonated Oils of guaranteed purity, and manufacture Special Oils to meet every requirement.

Tanning Extracts For over fifty years we have manufactured and specialized in these Extracts. Besides being among the largest producers in domestic extracts, we are leading importers of all foreign products.

Buttercup and Snowflake Brands Edible Peanut Oils

MARDEN, ORTH & HASTINGS CORPORATION

ESTABLISHED 1837

61 Broadway, New York City, U. S. A.

BOSTON, 225 Purchase Street
PHILADELPHIA, Widener Building
CLEVELAND, Rockefeller Building

130 N. Wells Street, CHICAGO
Hoge Building, SEATTLE
316 Clay Street, SAN FRANCISCO

Pepper, Capsicum, Red or Cayenne, Ground.

	Pounds.	Dollars.
1914	1,322,308	165,307
1915	1,827,666	207,379
1916	2,265,154	271,244
1917	3,636,876	455,897

Perfumery, Alcoholic, Toilet Waters, Etc.

	Pounds.	Dollars.
1913	286,025	819,685
1914	301,443	771,758
1915	240,975	689,930
1916	281,387	828,727
1917	359,200	1,085,369

Perfumery, Cosmetics and Toilet Preparations Not Containing Alcohol, Not Specially Provided For.

		Dollars.
1913	.....	1,026,369
1914	.....	1,086,211
1915	.....	1,542,131
1916	.....	1,271,614
1917	.....	1,702,939

Persian Berry Extracts for Dyeing.

	Pounds.	Dollars.
1913	64,883	7,173
1914	115,336	12,924
1915	92,876	12,245
1916	17,353	4,227
1917	8,507	1,837

Petroleum, Crude.

	Gallons.	Dollars.
1913	459,542,222	7,608,796
1914	843,080,788	11,779,938
1915	653,757,824	8,918,138
1916	859,736,962	12,226,179
1917	1,036,417,009	14,181,349

Petroleum, Refined, Benzine.

	Gallons.	Dollars.
1913	14,162,423	1,266,896
1914	16,152,167	1,399,630
1915	6,783,627	727,805
1916	5,100	2,150

Not stated separately after 1916.

Petroleum, Refined, Gasoline and Naphtha.

	Gallons.	Dollars.
1913	570	118
1914	14,175	1,992
1915	1,136,797	34,701
1916	2,638	458

Not stated separately after 1916.

Petroleum, Refined:—Benzine, Gasoline and Naphtha.

	Gallons.	Dollars.
1917	10,744,592	1,396,101

Petroleum, Refined, All Other.

	Gallons.	Dollars.
1913	1,464,412	307,479
1914	1,796,093	430,664
1915	496,968	98,696
1916	1,727,683	134,815
1917	32,259,588	2,221,816

Pewter and Britannia Metal, Old and Fit Only to Be Remanufactured.

	Pounds.	Dollars.
1913	22,270	6,099
1914	10,408	2,219
1915	23,039	5,397
1916	28,294	8,002
1917	17,608	10,192

Phenolic Resin.

	Pounds.	Dollars.
1917	134,690	11,339

Not stated prior to 1917.

Phenolphthalein.

	Pounds.	Dollars.
1914	14,076	14,090
1915	49,326	46,295
1916	11,432	9,740
1917	3,576	7,794

Not stated prior to 1914.

Phosphates, Crude.

	Tons.	Dollars.
1913	23,478	184,204
1914	23,551	177,838
1915	2,901	26,982
1916	8,190	69,820
1917	96	1,420

Phosphorus.

	Pounds.	Dollars.
1913	650	370
1914	605	284
1915	612	251
1916	.....	.....
1917	4,010	2,306

Photographic Chemicals (Coal Tar).

	Pounds.	Dollars.
1917	11,322	103,580

Not stated prior to 1917.

Pimento, Unground.

1913	7,212,109	259,503
1914	1,517,971	54,506
1915	1,330,158	36,749
1916	1,355,575	46,241
1917	3,277,576	118,401

Pitch, Burgundy.

	Pounds	Dollars.
1913	977,629	43,709
1914	1,055,327	40,480
1915	131,967	4,061
1916	14,756	673
1917	25	3

Pitch, Marine Glue.

	Pounds.	Dollars.
1913	393,186	14,392
1914	317,508	15,154
1915	56,332	3,807
1916	481,633	20,496
1917	327,311	18,447

Plaster Rock, or Gypsum, Crude.

	Tons.	Dollars.
1913	386,927	462,889
1914	417,580	482,320
1915	260,161	316,308
1916	481,633	20,496
1917	230,892	276,902

Plaster Rock, or Gypsum, Ground or Calcined.

	Tons.	Dollars.
1913	3,910	26,228
1914	4,292	30,225
1915	3,943	30,333
1916	6,494	36,322
1917	12,321	107,999

Plasters, Healing, or Curative, and Court Plaster.

		Dollars.
1913	.....	4,639
1914	.....	10,929
1915	.....	7,171
1916	.....	8,094
1917	.....	7,571

Plumbago or Graphite.

	Tons.	Dollars.
1913	25,233	1,972,177
1914	24,366	1,846,074
1915	17,057	1,387,873
1916	30,938	4,298,530
1917	42,270	9,078,160

Polishing and Cleaning Creams.

		Dollars.
1914	.....	6,085
1915	.....	11,600
1916	.....	14,133
1917	.....	7,208

Not stated prior to 1914.

Potash, Bicarbonate of, Refined.

	Pounds.	Dollars.
1913	311,645	14,295
1914	478,853	22,767
1915	383,534	20,541
1916	2,062	614
1917	10,053	5,271

Potash, Bichromate and Chromate of.

	Pounds.	Dollars.
1913	27,671	2,601
1914	34,960	2,622
1915	40,227	3,317
1916	2,291	391
1917	2,404	962

Potash, Carbonate of, Crude.

	Pounds.	Dollars.
1913	10,063,912	295,066
1914	9,046,302	240,451
1915	8,620,504	291,341
1916	444,241	27,639
1917	1,069,408	185,910

Potash, Carbonate of, Refined.

	Pounds.	Dollars.
1913	14,035,111	412,567
1914	10,421,005	668,958
1915	2,377,940	92,959
1916	174,587	38,604
1917	202,385	63,170

Potash, Caustic or Hydrate of, Unrefined.

	Pounds.	Dollars.
1912	8,422,007	330,684
1913	8,994,449	348,501
1914	8,565,451	326,650

Included in "Potash, Hydrate of, etc.," after 1914.

Potash, Caustic or Hydrate of, Refined.

	Pounds.	Dollars.
1912	77,184	8,097
1913	112,822	11,920
1914	18,751	1,977

Included in "Potash, Hydrate of, etc.," after 1914.

Potash, Chlorate of.

	Pounds.	Dollars.
1913	1,235,732	66,309
1914	40,519	3,408
1915	27,419	4,614
1916	.....	.....
1917	437,339	194,008

Potash, Crude, or Black Salts.

	Pounds.	Dollars.
1914	2,596,883	62,454
1915	4,076,783	83,502
1916	1,504,149	53,752
1917	2,819,235	233,111

Not stated prior to 1914.

Potash, Cyanide of.

	Pounds.	Dollars.
1913	950,890	137,535
1914	1,236,799	183,259
1915	747,627	143,331
1916	43,705	9,311
1917	70,147	49,513

Potash, Hydrate of, Containing Not More Than 15 Per Cent. of Caustic Soda.

	Pounds.	Dollars.
1915	4,993,471	225,002
1916	39,770	9,222
1917	74,780	33,648

Not stated prior to 1915.

Potash, Muriate of.

	Tons.	Dollars.
1913	223,887	6,737,757
1914	234,856	7,925,781
1915	102,882	3,060,353
1916	2,126	460,888
1917	606	174,806

Potash, Nitrate of, Refined.

	Tons.	Dollars.
1913	197	22,142
1914	166	20,173
1915	34	4,222
1916	2	749
1917	288	35,143

Potash, Permanganate of.

	Pounds.	Dollars.
1913	357,366	25,314
1914	1,351,855	91,065
1915	1,039,304	78,924
1916	214,291	57,306
1917	6,946	11,727

Potash, Prussiate of, Red.

	Pounds.	Dollars.
1913	65,316	11,302
1914	89,976	15,325
1915	83,574	14,923
1916	2,560	3,520
1917	4,523	10,425

Potash, Prussiate of, Yellow.

	Pounds.	Dollars.
1913	2,812,408	309,302
1914	3,508,228	390,021
1915	2,316,736	255,711
1916	44,156	31,551
1917	41,128	32,251

Potash, Sulphate of.

	Tons.	Dollars.
1913	48,023	1,798,369
1914	44,986	1,887,491
1915	21,705	1,071,623
1916	2,427	197,808
1917	656	20,538

Potassium, Iodide.

	Pounds.	Dollars.
1913	120	239
1914	270	491
1915	4	13
1916	309	1,032
1917	24,357	58,752

Putty (Whiting and Paris White), Ground in Oil.

	Pounds.	Dollars.
1913	36,434	881
1914	37,020	911
1915	13,078	343
1916	16,082	388
1917	33,286	1,472

Quebracho Extract.

	Pounds.	Dollars.
1913	63,604,814	1,672,814
1914	99,605,839	2,699,104
1915	125,566,857	3,676,749
1916	81,501,892	5,432,458
1917	61,977,849	5,382,433

Quebracho Wood.

	Tons.	Dollars.
1913	101,869	1,300,126
1914	73,957	900,850
1915	54,715	750,873
1916	106,884	1,598,462
1917	95,211	1,080,948

Quicksilver.

	Pounds.	Dollars.
1913	330	357
1914	444,673	192,606
1915	561,924	292,344
1916	554,852	595,057
1917	242,526	239,401

Quill Toothpicks.

		Dollars.
1913	.....	18,646
1914	.....	10,041
1915	.....	8,519
1916	.....	21,548
1917	.....	26,256

Quill, Other Manufactures of.

		Dollars.
1913	.....	6,969
1914	.....	11,941
1915	.....	9,842
1916	.....	1,347
1917	.....	1,548

Quinia, Sulphate of.

	Ounces.	Dollars.
1913	2,279,784	397,409
1914	2,224,765	486,641
1915	1,508,931	378,511
1916	1,409,228	1,022,621
1917	623,947	324,438

Radium, and Salts of, and Radioactive Substances.

		Dollars.
1914	.....	29,983
1915	.....	29,963
1916	.....	3,712
1917	.....	50

Not stated prior to 1914.

Red Lead.

	Pounds.	Dollars.
1913	145,478	7,223
*1914	99,867	5,674
1915	6,697	342
1916	196	43
1917	20,471	5,296

*29,940 pounds, $3,681, came in free of duty for construction and equipment of vessels.

Rennets, Raw or Prepared.

		Dollars.
1913	.....	129,588
1914	.....	129,720
1915	.....	106,614
1916	.....	86,694
1917	.....	13,154

Rhubarb Root.

	Pounds.	Dollars.
1913	131,701	16,554
1914	181,240	22,554
1915	233,699	24,592
1916	155,924	17,701
1917	238,601	32,084

Rose Leaves.

		Dollars.
1913	.....	67
1914	.....	1,434
1915	.....	484
1916	.....	1,060
1917	.....	4,199

Rosin, Violin.

		Dollars.
1913	.....	30,621
1914	.....	11,625
1915	.....	6,532
1916	.....	4,293
1917	.....	2,872

Saccharin.

	Pounds.	Dollars.
1913	47	64
1914	8	30
1915	5,617	6,737
1916	12,954	76,739
1917	1,596	18,276

Saffron, Safflower, and Extract of, and Saffron Cake, Not Containing Alcohol.

		Dollars.
1913	.....	93,146
1914	.....	85,678
1915	.....	70,132
1916	.....	111,420
1917	.....	124,233

Sage, Unground.

	Pounds.	Dollars.
1913	1,299,120	19,893
1914	2,005,469	39,309
1915	822,083	48,464
1916	1,835,815	130,444
1917	1,528,828	92,409

Sago, Crude, and Sago Flour.

	Pounds.	Dollars.
1913	12,389,192	230,902
1914	9,970,717	160,924
1915	6,330,400	106,090
1916	10,999,587	234,073
1917	7,893,055	204,864

Salep or Salop.

		Dollars.
1913	.....	44
1914	.....	75
1915	.....	2,762
1916	.....	.....
1917	.....	.....

Salicin.

	Pounds.	Dollars.
1913	3,274	12,146
1914	4,129	14,962
1915	1,809	6,560
1916	453	2,136
1917	390	2,307

Salol.

	Pounds.	Dollars.
1914	660	219
1915	23,430	11,445
1916	4,069	2,182
1917	.....	.....

Not stated prior to 1914.

Salt.

	100 pounds.	Dollars.
1912	2,901,815	379,540
1913	2,508,561	356,911
1914	3,397,496	456,426

Stated separately after 1914; see following classes.

Salt in Bags, Barrels or Other Packages.

	100 pounds.	Dollars.
1915	620,462	213,676
1916	552,616	195,791
1917	375,658	176,784

Salt in Bulk.

	100 pounds.	Dollars.
1915	1,959,633	172,888
1916	1,591,032	134,975
1917	1,806,867	158,096

Salt Cake (Sulphate of Soda).

	Tons.	Dollars.
1913	189	4,771
1914	206	2,436
1915	189	3,566
1916	91	6,392
1917	216	4,122

Saltpeter, Crude.

	Pounds.	Dollars.
1913	10,989,383	288,996
1914	3,547,252	115,470
1915	677,785	22,483
1916	5,412,130	734,128
1917	10,171,654	904,506

Santonine, and Its Combination with Acids, Not Subject to Duty.

	Pounds.	Dollars.
1913	1,982	44,358
1914	5,230	125,128
1915	912	26,558
1916	20,925	586,850
1917	111	3,966

Saponin.

		Dollars.
1914	.....	6,643
1915	.....	5,967
1916	.....	413
1917	.....	.....

Not stated prior to 1914.

Sarsaparilla Root.

	Pounds.	Dollars.
1913	301,308	38,360
1914	224,970	36,284
1915	250,178	36,055
1916	291,276	41,489
1917	146,047	18,994

Seed, Anise.

	Pounds.	Dollars.
1913	1,290,831	84,941
1914	231,117	15,412
1915	432,863	30,932
1916	789,487	68,713
1917	475,100	67,2[illegible]

Seed, Beet (Except Sugar).

	Pounds.	Dollars.
1913	887,339	138,895
1914	1,076,525	119,410
1915	991,208	112,092
1916	785,807	99,494
1917	483,112	83,468

Seed, Canary.

	Pounds.	Dollars.
1913	6,219,623	184,596
1914	4,503,280	190,530
1915	4,911,298	208,835
1916	5,368,551	181,898
1917	4,909,107	166,774

Seed, Caraway.

	Pounds.	Dollars.
1913	3,691,831	234,294
1914	1,949,309	107,599
1915	2,895,418	172,743
1916	2,978,581	280,146
1917	505,804	71,745

Seed, Cardamom.

	Pounds.	Dollars.
1913	113,461	104,287
1914	80,782	72,148
1915	152,679	106,180
1916	226,687	119,162
1917	214,464	88,005

Seed, Coriander.

	Pounds.	Dollars.
1913	1,324,735	35,817
1914	1,238,430	46,158
1915	1,496,288	36,851
1916	1,587,923	54,570
1917	1,111,127	124,098

Seed, Cotton.

	Pounds.	Dollars.
1913	3,264,114	66,315
1914	8,891,303	66,085
1915	22,724,868	114,983
1916	30,113,684	251,508
1917	53,362,927	932,335

Seed, Cummin.

	Pounds.	Dollars.
1913	529,667	27,178
1914	530,550	31,709
1915	694,344	83,534
1916	1,446,006	225,672
1917	1,159,598	207,012

Seed, Fennel.

	Pounds.	Dollars.
1913	187,995	14,410
1914	207,135	12,299
1915	293,810	13,622
1916	312,927	20,751
1917	443,704	48,497

Seed, Fenugreek.

	Pounds.	Dollars.
1913	1,944,407	37,434
1914	1,619,230	29,601
1915	1,434,825	30,295
1916	811,270	20,672
1917	1,052,843	71,102

Seed, Flaxseed or Linseed.

	Bushels.	Dollars.
1913	5,274,922	8,118,319
1914	8,652,022	10,571,654
1915	10,373,902	12,933,543
1916	14,637,543	20,151,633
1917	12,484,859	25,295,231

Seed, Millet, Prepared.

		Dollars.
1913	.....	16,977
1914	.....	26,690
1915	.....	1,790
1916	.....	249
1917	.....	.....

Seed, Mustard.

	Pounds.	Dollars.
1913	12,719,682	417,370
1914	11,543,941	370,964
1915	10,157,934	543,586
1916	16,402,112	1,070,567
1917	9,962,122	776,546

Seed, Poppy.

	Bushels.	Dollars.
1913	77,396	237,069
1914	56,322	126,744
1915	52,899	172,018
1916	26,648	176,776
1917	3,878	25,565

Seed, Rape.

	Pounds.	Dollars.
1913	4,308,750	169,634
1914	5,970,937	211,301
1915	5,194,132	230,280
1916	9,977,353	311,212
1917	4,819,360	186,877

NATIONAL U.S.A. COLORS

The foundations of our business

¶ To establish the making of colors as a self-contained American industry it was necessary to provide that the basic raw materials be American in origin and in manufacture. In no other way could independence be assured. With this in view we developed a plant at Marcus Hook, Pennsylvania, which has a producing capacity of aniline oil five times as great as the total consumption in this country prior to the war. The National Aniline & Chemical Company, Inc., is now the largest producer of aniline oil in the world.

¶ For the production of the finished colors we have two plants, one at Buffalo and one at Brooklyn. The Buffalo plant is an expansion of the pre-war unit, which under its original owners was a pioneer in the American color industry. During the war it has been so greatly expanded that today it is as large as a German unit of the same class. Our Brooklyn plant is an entirely new war installation, with a capacity in color production second only to that of Buffalo.

¶ To carry forward this enterprise the National company is capitalized at twenty-five million dollars. All the raw materials are the products of American factories, and in these plants chemists are working to obtain and develop a line as varied as is demanded by American consumers. Much remains to be done, but the foundations have been solidly laid.

¶ In the turmoil and confusion of war it has been the producing units of this company which have played the leading part in keeping American mills in operation. This is a fact we are proud of. We now look to the future with confidence. Our department of research, our staffs in factory and laboratory, our loyal skilled workers, and the developments under way warrant us in the belief that NATIONAL products will abide in favor. We are striving earnestly not only to bring to American consumers the dyestuffs which are most needed, but to make both quality and service the very best that experience, science, and conscientious effort can produce.

National Aniline & Chemical Company

Incorporated

244 Madison Avenue, New York

BRANCHES

Boston	Charlotte	Cincinnati	Milwaukee	Philadelphia
Buffalo	Chicago	Hartford	Minneapolis	Providence
		Kansas City		

WORKS

Buffalo	Marcus Hook
Brooklyn	Wappingers Falls

Seed, Soya Bean.

	Pounds.	Dollars.
1914	1,929,435	49,507
1915	3,837,865	87,300
1916	3,003,065	78,963
1917	5,334,334	132,572

Not stated prior to 1914.

Seed, Sugar Beet.

	Pounds.	Dollars.
1913	14,783,069	1,066,549
1914	10,490,089	804,209
1915	15,892,831	1,410,328
1916	9,047,902	1,031,186
1917	14,465,635	1,684,572

Selenium and Salts of.

		Dollars.
1914	.....	363
1915	.....	43
1916	.....	16
1917	.....	302

Not stated prior to 1914.

Senna, in Leaves.

	Pounds.	Dollars.
1913	2,634,117	150,555
1914	2,454,772	173,054
1915	2,180,288	209,315
1916	2,794,400	361,881
1917	5,116,315	844,733

Sheep Dip.

		Dollars.
1913	.....	63,527
1914	.....	16,842
1915	.....	32,963
1916	.....	21,198
1917	.....	17,185

Sienna and Sienna Earths.

	Pounds.	Dollars.
1913	3,962,601	57,358
1914	6,489,329	55,925
1915	6,656,031	64,658
1916	5,206,292	83,428
1917	2,990,972	61,163

Silver Leaf.

	100 leaves.	Dollars.
1913	17,130	2,122
1914	34,070	4,353
1915	31,298	3,718
1916	6,445	802
1917	1,125	135

Slag, Basic, Ground or Unground.

	Tons.	Dollars.
1913	5,124	146,477
1914	9,509	108,565
1915	651	7,309
1916	81	1,031
1917	41	549

Soap, Castile.

	Pounds.	Dollars.
1913	4,656,365	357,868
1914	4,004,965	308,310
1915	4,067,921	341,107
1916	3,245,550	335,580
1917	2,390,356	306,126

Soap, Medicinal.

	Pounds.	Dollars.
1913	42,518	14,734
1914	74,132	29,396
1915	32,048	14,082
1916	16,455	3,523
1917	4,287	1,975

Soap Powder.

		Dollars.
1914	.....	211
1915	.....	3,362
1916	.....	19,668
1917	.....	7,800

Not stated prior to 1914.

Soap, Toilet, Perfumed.

		Dollars.
1913	.....	324,207
1914	.....	248,194
1915	.....	193,646
1916	.....	147,819
1917	.....	184,613

Soap, Toilet, Unperfumed.

		Dollars.
1914	.....	100,650
1915	.....	140,048
1916	.....	82,057
1917	.....	64,570

Not stated prior to 1914.

Soap, All Other, Not Specially Provided For.

		Dollars.
1913	.....	58,526
1914	.....	84,745
1915	.....	53,940
1916	.....	18,245
1917	.....	21,406

Soda, Ash.

	Pounds.	Dollars.
1913	3,100,790	35,461
1914	2,228,991	28,100
1915	2,127,542	29,022
1916	878,175	20,178
1917	1,047,295	29,239

Soda, Arsenate of.

	Pounds.	Dollars.
1913	1,267,998	55,941
1914	228,270	8,267
1915	85,850	3,188
1916	35,176	3,436
1917	23,296	2,404

Soda, Benzoate of.

	Pounds.	Dollars.
1914	190	97
1915	40,903	19,183
1916	35,188	100,195
1917	80,755	339,868

Not stated prior to 1914.

Soda, Bicarbonate of.

	Pounds.	Dollars.
1913	80,699	2,238
1914	85,873	2,324
1915	93,318	2,584
1916	129,414	2,867
1917	34,742	1,821

Soda, Bichromate and Chromate of.

	Pounds.	Dollars.
1913	9	3
1914	11,056	585
1915	.....	.....
1916	6,154	3,630
1917	.....	.....

Soda, Borate of, or Borax, Refined.

	Pounds.	Dollars.
1914	4,522	541
1915	2,265	314
1916	682	112
1917	614	109

Not stated prior to 1914.

Soda, Chlorate of.

	Pounds.	Dollars.
1913	50	10
1914	489	84
1915	62	6
1916	22,176	3,105
1917	33,600	1,080

Soda, Crystal Carbonate of.

	Pounds.	Dollars.
1913	169,174	2,928
1914	307,488	3,323
1915	144,432	2,748
1916	49,251	889
1917	60,464	1,299

Soda, Cyanide of.

	Pounds.	Dollars.
1914	7,856,611	1,120,789
1915	6,187,418	955,907
1916	684,198	115,186
1917	1,875,824	861,777

Not stated prior to 1914.

Soda, Hydrate of, or Caustic.

	Pounds.	Dollars.
1913	671,480	26,364
1914	665,329	23,914
1915	444,185	19,318
1916	225,189	20,981
1917	109,983	21,052

Soda, Hyposulphite of.

	Pounds.	Dollars.
1913	7,299	226
1914	926,135	128,828
1915	1,855,223	265,363
1916	6,125	166
1917	1,836	1,193

Soda, Nitrate of.

	Tons.	Dollars.
1913	586,315	20,713,376
1914	554,045	17,926,163
1915	575,371	16,240,510
1916	1,072,833	32,129,926
1917	1,261,993	44,428,196

Soda, Nitrite of.

	Pounds.	Dollars.
1913	1,269,544	57,595
1914	1,844,379	76,813
1915	1,696,567	74,263
1916	2,693,330	170,160
1917	3,675,179	261,555

Soda, Phosphate of.

	Pounds.	Dollars.
1913	30	14
1914	1,364,789	24,975
1915	485,300	7,765
1916	1,066	79
1917	1,561	521

Soda, Prussiate of, Yellow.

	Pounds.	Dollars.
1913	1,887,369	118,475
1914	2,293,724	171,534
1915	1,529,958	120,477
1916	527,130	136,250
1917	175,980	96,592

Soda, Sal, or Soda Crystals.

	Pounds.	Dollars.
1913	128,027	1,910
1914	163,626	1,274
1915	104,800	606
1916	67,210	334
1917	50	4

Soda, Silicate of.

	Pounds.	Dollars.
1913	1,032,113	9,400
1914	1,046,569	10,881
1915	1,587,902	16,292
1916	1,567,617	18,694
1917	1,203,844	18,493

Soda, Sulphid of.

	Pounds.	Dollars.
1913	951,664	13,068
1914	2,529,911	36,553
1915	1,263,366	18,228
1916	80,513	4,616
1917	344,617	7,214

Soda, Sulphite of.

	Pounds.	Dollars.
1913	27,152	400
1914	382,540	5,627
1915	165,594	4,316
1916	435	60
1917	68,224	1,221

Sponges.

		Dollars.
1912	.....	311,547
1913	.....	289,909

Stated separately after 1913.

Sponges, Not Advanced by Chemical Process.

		Dollars.
1914	.....	279,211
1915	.....	334,252
1916	.....	474,626
1917	.....	593,233

Sponges, Bleached and Advanced by Chemical Process.

		Dollars.
1914	.....	38,300
1915	.....	42,042
1916	.....	68,797
1917	.....	55,077

Starch, Potato.

	Pounds.	Dollars.
1913	14,150,856	375,713
1914	13,934,741	233,661
1915	10,941,257	253,859
1916	2,337,717	72,736
1917	17,545,689	797,327

Starch, Soluble or Chemically Treated.

	Pounds.	Dollars.
1913	321,071	13,345
1914	1,697,392	54,604
1915	569,297	21,559
1916	7,420	417
1917	44,788	3,244

Starch, All Other.

	Pounds.	Dollars.
1913	677,785	40,645
1914	962,314	52,160
1915	952,934	52,537
1916	1,242,918	78,533
1917	888,345	62,132

Stearin, Oleo.

	Pounds.	Dollars.
1913	9,540,347	907,000
1914	5,679,535	497,973
1915	2,644,490	266,661
1916	910,478	81,280
1917	1,113,277	114,040

Steel Wool, or Shavings.

	Pounds.	Dollars.
1913	41,436	5,177
1914	27,113	3,693
1915	17,059	2,139
1916	148	26
1917	.....	.....

Strontia, Oxide of.

		Dollars.
1913	.....	474
1914	.....	1,969
1915	.....	7,268
1916	.....	8,311
1917	.....	21,184

Strychnia or Strychnine, and Its Combination with Acids Not Subject to Duty.

	Ounces.	Dollars.
1913	966,576	4,112,057
1914	846,905	3,753,879
1915	26,967	11,449
1916	59,278	37,652
1917	33,323	25,617

Sulphur Ore, as Pyrites or Sulphuret of Iron, Containing Not in Excess of 25 Per Cent. Sulphur.

	Tons.	Dollars.
1913	532	877
1914	17,419	5,403
1915	26,967	11,449
1916	1,370,059	7,121,614
1917	935,749	5,865,913

Sulphur or Brimstone, Crude.

	Tons.	Dollars.
1913	19,258	374,024
1914	20,236	346,875
1915	25,542	442,975
1916	22,533	372,599
1917	11,819	205,980

Sulphur Lac or Precipitated.

	Pounds.	Dollars.
1913	715,876	13,723
1914	231,696	13,636
1915	208,568	13,187
1916	217,997	16,628
1917	69,145	7,009

Sulphur, Refined.

	Tons.	Dollars.
1913	1,742	41,626
1914	1,523	39,634
1915	1,296	36,275
1916	850	26,778
1917	.....	.....

Sulphur, Sublimed or Flowers of.

	Tons.	Dollars.
1913	6,104	122,093
1914	599	15,841
1915	550	31,202
1916	200	7,512
1917	295	13,317

Sumac, Unground.

	Pounds.	Dollars.
1913	621,366	12,420
1914	1,335,566	32,238
1915	1,258,204	32,613
1916	1,131,368	28,164
1917	760,015	27,769

Sumac, Ground.

	Pounds.	Dollars.
1913	14,112,112	289,255
1914	9,678,719	231,689
1915	12,048,917	294,434
1916	20,411,022	527,102
1917	10,877,008	337,404

Sumac, Extract.

	Pounds.	Dollars.
1913	1,270,825	44,568
1914	1,467,297	59,022
1915	727,449	35,066
1916	36,003	4,108
1917	161,507	13,944

Talcum, Ground, Etc.

	Pounds.	Dollars.
1913	23,660,095	122,623
1914	32,498,066	173,023
1915	30,434,850	187,871
1916	33,738,067	207,179
1917	34,288,429	238,479

Talcum, Steatite and French Chalk, Crude.

	Pounds.	Dollars.
1914	2,807,974	23,369
1915	3,478,711	15,322
1916	4,681,163	9,363
1917	3,736,899	11,477

Not stated prior to 1914.

Tallow.

	Pounds.	Dollars.
1913	490,505	41,710
1914	3,371,833	231,924
1915	12,634,594	823,958
1916	4,779,076	396,787
1917	31,136,527	3,108,274

Tanks, or Vessels, Cylindrical or Tubular, for Holding Gas, Liquids, or Other Material.

		Dollars.
1913	.....	499,031
1914	.....	459,842
1915	.....	226,911
1916	.....	242,773
1917	.....	234,217

Tapioca, Tapioca Flour, Cassava or Cassady.

	Pounds.	Dollars.
1913	71,336,089	1,855,169
1914	71,304,728	1,590,614
1915	60,080,060	1,324,184
1916	64,838,470	1,992,399
1917	100,517,107	3,506,479

Tar, Coal, Crude, and Pitch of.

	Barrels.	Dollars.
1913	14,093	23,601
1914	17,515	25,140
1915	16,391	23,874
1916	19,206	32,636
*1917	5,594	10,702

* Stated separately after Sept. 8, 1916.

Coal Tar, Crude.

	Barrels.	Dollars.
1917	5,864	10,381

Coal Tar, Pitch of.

	Barrels.	Dollars.
1917	7,258	8,146

Tar and Pitch of Wood.

	Barrels.	Dollars.
1913	178	2,777
1914	561	7,946
1915	129	1,551
1916	31	282
1917	631	5,903

Tartrate of Soda, or Potassa, or Rochelle Salts.

	Pounds.	Dollars.
1913	138,115	16,927
1914	186,305	23,419
1915	233,909	19,244
1916	187	47
1917	17,840	4,352

Tea, Impure, Waste, Siftings or Sweepings, for Manufacturing Purpose.

	Pounds.	Dollars.
1913	7,168,410	215,938
1914	5,213,966	178,302
1915	4,729,208	153,390
1916	4,796,766	201,507
1917	7,626,688	478,326

Terpin Hydrate.

	Pounds.	Dollars.
1914	6,929	1,020
1915	4,477	657
1916	.....	.....
1917	.....	.....

Not stated prior to 1914.

Thorium, Nitrate of.

	Pounds.	Dollars.
1913	112,105	212,263
1914	144,413	309,260
1915	78,516	186,385
1916	22,261	53,496
1917	1,877	5,263

Thorium, Oxide and Other Salts of.

	Pounds.	Dollars.
1914	2,465	4,075
1915	82	359
1916	2,612	6,092
1917	1,616	3,984

Not stated prior to 1914.

Thymol.

	Pounds.	Dollars.
1914	19,045	24,765
1915	4,772	12,921
1916	443	1,973
1917	1,759	13,741

Not stated prior to 1914.

Tin, Black, Oxide of, or Cassiterite.

	Pounds.	Dollars.
1913	82,983	18,536
1914	19,549	3,022
1915	49,068	10,798
1916	40,533	8,134
1917	54,367	12,816

Tin Foil.

		Dollars.
1913	.....	430
1914	.....	649
1915	.....	1,218
1916	.....	1,596
1917	.....	2,283

Toluol.

	Pounds.	Dollars.
1917	135,000	81,000

Not stated prior to 1917.

Tonka Beans.

	Pounds.	Dollars.
1913	783,888	1,140,409
1914	545,156	677,195
1915	132,119	95,222
1916	143,321	94,700
1917	222,754	156,974

Turmeric.

		Dollars.
1913	.....	33,735
1914	.....	22,978
1915	.....	10,145
1916	.....	180,948
1917	.....	112,372

Turpentine, Spirits of.

	Gallons.	Dollars.
1913	56,457	19,296
1914	72,679	28,818
1915	13,680	6,095
1916	20,675	8,262
1917	18,286	6,271

Turpentine, Venice.

	Pounds.	Dollars.
1913	60,678	9,169
1914	112,010	17,434
1915	20,904	3,172
1916	7,901	772
1917	1,045	248

Ultramarine, Dry, in Pulp or Mixed with Water.

	Pounds.	Dollars.
1913	695,938	62,250
1914	901,206	78,392
1915	641,381	62,715
1916	401,605	44,709
1917	388,201	36,483

Umber, Crude, Not Powdered, Washed or Pulverized.

	Pounds.	Dollars.
1912	2,962,166	13,877
1913	5,256,077	29,391
*1914	1,069,059	7,138

* Covers period July 1 to October 3, 1913, only. Stated as "Umber and Umber Earths" after October 3, 1913.

Umber, Powdered, Washed or Pulverized.

	Pounds.	Dollars.
1912	762,772	11,283
1913	817,500	11,217
*1914	151,713	2,478

* Covers period July 1 to October 3, 1913, only. Stated as "Umber and Umber Earths" after October 3, 1913.

Umber, Ground in Oil or Water.

	Pounds.	Dollars.
1912	5,463	399
1913	6,053	380
*1914	2,538	156

* Covers period July 1, to October 3, 1913, only. Stated as "Umber and Umber Earths" after October 3, 1913.

Umber and Umber Earths.

	Pounds.	Dollars.
1914	3,381,919	25,798
1915	7,225,537	36,128
1916	8,914,389	55,076
1917	9,211,112	66,717

Included in the three preceding classes prior to 1914.

Uranium, Oxide and Salts of.

		Dollars.
1913	.....	21,435
1914	.....	5,762
1915	.....	1,969
1916	.....	2,099
1917	.....	3,018

Urea.

	Pounds.	Dollars.
1913	.....	.....
1914	17,981	5,798
1915	65,464	31,994
1916	79,172	32,498
1917	56,429	36,248

Vanilla Beans.

	Pounds.	Dollars.
1913	1,049,617	2,641,574
1914	694,531	1,739,674
1915	749,146	1,839,995
1916	796,890	1,474,228
1917	733,565	1,583,325

Valonia.

	Pounds.	Dollars.
1913	5,295,762	79,610
1914	7,854,056	116,406
1915	6,352,190	88,061
1916	.....	.....
1917	.....	.....

Vanillin.

	Ounces.	Dollars.
1913	880	171
1914	33,668	6,446
1915	451	98
1916	.....	.....
1917	.....	.....

Varnish, Gold Size, or Japan.

		Dollars.
1914	.....	8,766
1915	.....	10,228
1916	.....	423
1917	.....	2,504

Not stated prior to 1914.

Cable Address, Lycurgus, New York

General Chemical Co.

Makers of

STANDARD CHEMICALS

Philadelphia New York Chicago San Francisco
St. Louis Cleveland Pittsburgh Buffalo Syracuse
Easton Bridgeport Providence

ACIDS

Sulphuric,
Fuming Sulphuric,
Muriatic,
Nitric,
Mixed,
Acetic,
Hydrofluoric,
Battery and Phosphoric
Acids and Battery Solutions

SODAS

Sulphate,
Calcined Sulphate,
Bisulphate,
Bisulphite,
Sulphite,
Sulphide Crystals,
Concentrated Sulphide,
Phosphate,
Acetate,
Silicate,
Caustic and Sal Sodas;
and Trisodium Phosphate,
Glassmakers' Salt Cake,
Glauber's Salt
and Nitric Cake

ALUM

Lump, Ground
and Filter Alums

ALUMINA

Sulphate of Alumina

TIN

Muriate of Tin Crystals and
Muriate of Tin Solution
Bichloride and Oxy
Muriate of Tin

AMMONIA

Aqua Ammonia

IRON

Sulphide,
True Nitrate,
Copperas,
Nitrate of Iron
and Copperas

SULPHUR

Roll Brimstone
Flour and
Flowers of Sulphur

ZINC

Sulphate of Zinc

LEAD

Acetate of Lead Crystals
and Solutions

MAGNESIA

Epsom Salt

COPPER

Sulphate of Copper
or Blue Vitriol

Distributors of

"Baker & Adamson" Standard Chemically Pure Acids and Salts

Varnish, Spirit.

	Gallons.	Dollars.
1913	1,475	4,078
1914	10,127	24,329
1915	581	1,937
1916	1,318	6,874
1917	2,771	13,426

Varnish, All Other.

	Gallons.	Dollars.
1913	25,093	51,710
1914	16,888	31,032
1915	27,943	51,791
1916	25,542	62,776
1917	20,366	47,740

Venetian Red.

	Pounds.	Dollars.
1913	2,989,104	23,649
1914	3,858,611	33,077
1915	2,478,959	20,677
1916	1,687,616	12,947
1917	835,161	8,296

Verdigris, Acetate and Sub-Acetate of Copper.

	Pounds.	Dollars.
1913	55,465	7,053
1914	19,009	2,530
1915	17,569	2,491
1916	81,005	15,648
1917	50,216	13,052

Vermilion Reds.

	Pounds.	Dollars.
1913	85,337	44,753
1914	72,851	34,379
1915	95,629	58,697
1916	71,515	92,990
1917	17,557	24,170

Wafers, Unleavened, or Not Edible.

		Dollars.
1913	.....	28,564
1914	.....	32,816
1915	.....	26,556
1916	.....	28,736
1917	.....	27,417

Wax, Mineral.

	Pounds.	Dollars.
1913	6,440,878	507,656
1914	7,974,157	537,684
1915	6,284,757	401,500
1916	2,081,083	141,539
1917	2,064,722	150,241

Wash Blue Containing Ultramarine.

	Pounds.	Dollars.
1913	97,220	13,312
1914	*	12,906
1915	.....	6,485
1916	.....	4,907
1917	.....	25,280

* Quantity not stated after 1913.

Wax, Vegetable.

	Pounds.	Dollars.
1913	5,542,474	1,152,738
1914	4,336,276	1,043,337
1915	5,388,398	999,535
1916	9,594,111	1,551,996
1917	7,210,103	1,742,640

Whalebone, Unmanufactured.

	Pounds.	Dollars.
1913	8,993	12,686
1914	9,624	11,781
1915	40,088	68,262
1916	27,855	17,936
1917	10,221	6,607

White Lead, and All Pigments Containing Lead.

	Pounds.	Dollars.
1913	678,078	46,527
1914	656,884	44,436
1915	514,876	35,743
1916	153,474	11,970
1917	57,045	5,054

Whiting and Paris White, Dry.

	Pounds.	Dollars.
1913	3,536,747	14,032
1914	2,361,605	10,453
1915	5,387,,038	15,705
1916	3,655,123	14,459
1917	2,147,895	11,292

Wicking, Lamp, Stove or Candle, Made of Cotton or Other Vegetable Fiber.

	Pounds.	Dollars.
1913	44,653	13,771
1914	47,208	15,983
1915	37,932	11,758
1916	20,074	5,105
1917	21,371	6,918

Witherite.

	Pounds.	Dollars.
1913	2,109,842	15,224
1914	1,223,926	7,927
1915	838,222	6,074
1916	1,714,414	20,446
1917	1,420,752	16,071

Wood Flour.

	Pounds.	Dollars.
1913	11,795,852	62,447
1914	15,171,972	84,751
1915	11,482,934	60,131
1916	13,731,979	74,479
1917	8,703,664	57,521

Xylol.

	Pounds.	Dollars.
1917	181,104	8,836

Not stated prior to 1917.

Zinc Bearing Ores, Including Calamine.

	Tons, gross weight.	Zinc contents, pounds.	Dollars.
1913	27,481	25,214,528	526,173
1914	14,402	11,762,861	169,986
1915	17,341	14,259,176	321,135
1916	86,611	81,779,564	3,376,166
1917	327,280	293,958,919	8,186,015

Zinc, Chloride of.

	Pounds.	Dollars.
1913	1,252,319	37,078
1914	789,296	23,503
1915	194,250	5,805
1916	12,643	463
1917	6,216	629

Zinc Dust.

	Pounds.	Dollars.
1913	5,615,766	317,492
1914	4,788,433	223,775
1915	2,278,533	132,822
1916	1,365,705	255,192
1917	622,587	83,016

Zinc Oxide, Dry.

	Pounds.	Dollars.
1912	4,842,948	310,362
1913	6,148,120	389,435
*1914	1,408,162	88,410

* Figures are for July 1 to October 3, 1913. Stated separately after October 3, 1913.

Zinc, Oxide of, Ground, Dry.

	Pounds.	Dollars.
1914	5,315,807	309,106
1915	2,565,434	148,143
1916	1,441,290	244,934
1917	285,433	65,633

Zinc, Oxide of, Ground in or Mixed with Oil or Water.

	Pounds.	Dollars.
1914	292,871	21,596
1915	154,451	11,626
1916	66,347	7,187
1917	14,089	1,225

Zinc Sulphate.

	Pounds.	Dollars.
1913	23,778	817
1914	107,065	2,176
1915	68,940	1,027
1916	.....	.....
1917	28	44

Zinc, Sulphide of, White.

	Pounds.	Dollars.
1913	5,163,642	144,812
1914	1,338,999	42,130
1915	283,356	8,979
1916	96,402	7,368
1917	53,587	8,451

DOMESTIC EXPORTS FROM THE UNITED STATES

Fiscal Years Ending June 30, 1913-1917.

Acid, Sulphuric.

	Pounds.	Dollars.
1913	9,790,532	89,783
1914	12,131,750	125,892
1915	46,771,510	516,436
1916	82,020,246	1,960,532
1917	58,604,048	963,888

Acids, All Other.

		Dollars.
1913	.....	364,347
1914	.....	357,035
1915	.....	2,611,741
1916	.....	22,717,335
1917	.....	54,725,124

Alcohol, Wood.

	Proof gallons.	Dollars.
1913	1,837,173	788,143
1914	1,598,776	662,486
1915	944,374	438,846
1916	1,472,258	857,161
1917	825,394	646,939

Alcohol, All Other, Including Pure, Neutral or Cologne Spirit.

	Proof gallons.	Dollars.
1913	151,232	58,346
1914	187,845	67,728
1915	200,455	108,985
1916	24,433,243	8,784,742
1917	51,944,062	16,027,867

Asbestos, Unmanufactured.

	Tons.	Dollars.
1917	2,793	164,419

Not stated prior to 1917.

Asphaltum, Unmanufactured.

	Tons.	Dollars.
1913	54,560	1,164,486
1914	49,831	1,131,086
1915	28,553	616,240
1916	42,754	830,946
1917	34,423	712,051

Asphaltum, Manufactured.

		Dollars.
1913	.....	475,541
1914	.....	362,347
1915	.....	400,154
1916	.....	510,290
1917	.....	554,665

Baking Powder.

	Pounds.	Dollars.
1913	2,844,575	844,826
1914	2,725,904	790,274
1915	3,376,780	881,879
1916	3,969,965	980,113
1917	4,836,844	1,028,352

Bark, Extract of, for Tanning.

		Dollars.
1913	.....	524,063
1914	.....	639,941
1915	.....	2,226,257
1916	.....	5,902,799
1917	.....	3,908,573

Bark, for Tanning.

	Tons.	Dollars.
1913	1,683	46,499
1914	1,212	28,939
1915	825	21,424
1916	5,226	123,675
1917	1,850	49,907

Bauxite Concentrates.

	Tons.	Dollars.
1915	11,949	531,404
1916	19,317	929,309
1917	18,495	1,118,777

Beeswax.

	Pounds.	Dollars.
1913	116,296	33,131
1914	96,215	27,292
1915	181,328	57,971
1916	147,772	48,252
1917	383,722	131,698

Brushes.

		Dollars.
1915	.....	604,916
1916	.....	1,132,262
1917	.....	865,630

Calcium Carbide.

	Pounds.	Dollars.
1913	33,419,375	990,027
1914	32,845,649	962,040
1915	35,772,867	1,097,952
1916	37,873,692	1,211,267
1917	31,278,971	1,003,404

Candles.

	Pounds.	Dollars.
1913	2,595,912	246,274
1914	3,047,756	283,018
1915	4,250,026	417,345
1916	6,120,695	575,659
1917	6,576,632	749,360

Celluloid and Manufactures of.

		Dollars.
1913	.....	1,639,046
1914	.....	1,387,541
1915	.....	722,850
1916	.....	2,328,142
1917	.....	3,112,441

Cement, Hydraulic.

	Barrels (380 lbs.)	Dollars.
1913	3,999,715	5,822,107
1914	2,391,453	2,382,282
1915	2,361,451	3,241,686
1916	2,740,596	3,780,564
1917	2,345,854	4,111,560

Chalk.

		Dollars.
1913	.....	49,478
1914	.....	40,154
1915	.....	51,175
1916	.....	60,417
1917	.....	105,202

Charcoal.

		Dollars.
1913	.....	73,030
1914	.....	81,997
1915	.....	105,009
1916	.....	94,096
1917	.....	155,470

Chewing Gum.

		Dollars.
1913	.....	186,944
1914	.....	178,630
1915	.....	281,433
1916	.....	574,423
1917	.....	1,084,732

Clays: Fire Clay.

	Tons.	Dollars.
1917	44,098	201,398

Not stated prior to 1917.

Clays, All Other.

	Tons.	Dollars.
1917	26,078	169,544

Not stated prior to 1917.

Coal Tar.

	Barrels.	Dollars.
1913	121,168	152,273
1914	22,150	43,145
1915	21,317	39,647
1916	74,800	129,220
1917	63,879	145,599

Copper, Pigs, Ingots and Bars.

	Pounds.	Dollars.
1913	740,340,312	120,665,914
1914	864,602,721	128,137,408
1915	581,773,537	81,946,522

Subdivided after 1915.

Copper, Rods and Wire.

	Pounds.	Dollars.
1913	41,459,901	7,217,166
1914	32,503,236	5,298,686
1915	53,505,157	8,004,628

Not separately stated after 1915.

Copper, Unrefined, Black, Blister and Converted Copper in Bars, Pigs or Other Forms.

	Pounds.	Dollars.
1916	4,921,080	1,137,770
1917	18,423,985	5,462,637

Not separately stated prior to 1916.

Copper, Refined, in Ingots, Bars, Rods or Other Forms.

	Pounds.	Dollars.
1916	657,891,844	147,809,793
1917	937,956,783	266,941,722

Not separately stated prior to 1916.

Copper, Old and Scrap.

	Pounds.	Dollars.
1916	312,584	66,020
1917	1,521,396	413,340

Not separately stated prior to 1916.

Copper, Plates and Sheets.

	Pounds.	Dollars.
1913	61,050,138	10,028,960
1914	71,855,735	10,690,504
1915	34,355,789	5,103,778
1916	24,091,274	5,268,736
1917	34,641,227	10,086,918

Copper, Wire.

	Pounds.	Dollars.
1916	24,369,832	5,208,750
1917	28,958,007	9,269,683

Not separately stated prior to 1916.

Copper, Sulphate of.

	Pounds.	Dollars.
1913	5,052,680	262,561
1914	7,375,775	330,007
1915	10,238,806	445,580
1916	17,975,242	2,469,437
1917	28,132,770	3,013,193

Cork, Manufactures of.

		Dollars.
1913	.....	339,436
1914	.....	.....
1915	.....	211,795
1916	.....	455,424
1917	.....	541,579

Dyes and Dyestuffs.

		Dollars.
1913	.....	347,656
1914	.....	356,919
1915	.....	1,775,925
1916	.....	5,102,002
1917	.....	11,710,887

Egg Yolks, Canned Eggs, Etc.

		Dollars.
1913	.....	67,854
1914	.....	47,968
1915	.....	88,865
1916	.....	210,255
1917	.....	72,491

Emery and Other Abrasive Wheels.

		Dollars.
1913	.....	809,720
1914	.....	668,778
1915	.....	736,879
1916	.....	1,630,265
1917	.....	3,846,002

Fertilizers, Phosphate High-Grade Hard Rock.

	Tons.	Dollars.
1913	494,200	4,942,000
1914	476,335	4,763,350
1915	46,050	460,050
1916	44,330	429,130
1917	15,159	158,745

Fertilizers, Phosphate Rock, Land Pebble.

	Tons.	Dollars.
1913	777,898	4,577,963
1914	1,000,630	5,857,989
1915	222,472	1,276,759
1916	255,206	1,324,877
1917	179,094	704,326

Fertilizers, Phosphate Rock, All Other.

	Tons.	Dollars.
1913	794	4,127
1914	1,906	6,516
1915	887	5,888
1916	466	3,947
1917	8,108	255,389

Fertilizers, All Other.

	Tons.	Dollars.
1913	74,834	1,873,999
1914	61,801	1,360,908
1915	89,224	2,128,190
1916	124,979	3,580,542
1917	213,978	5,852,551

Flavoring Extracts and Fruit Juices.

		Dollars.
1913	.....	133,990
1914	.....	166,802
1915	.....	136,742
1916	.....	466,914
1917	.....	581,573

Fly Paper.

		Dollars.
1913	.....	178,176
1914	.....	217,857
1915	.....	115,921
1916	.....	75,155
1917	.....	77,425

German Silver.

		Dollars.
1913	.....	65,362
1914	.....	38,901
1915	.....	30,699
1916	.....	273,828
1917	.....	410,295

Ginseng.

	Pounds.	Dollars.
1913	221,901	1,665,731
1914	224,605	1,832,686
1915	103,184	919,931
1916	256,082	1,597,508
1917	198,483	1,386,208

Glass Bottles, Vials, Demijohns, Carboys and Jars.

		Dollars.
1913	.....	808,327
1914	.....	711,353
1915	.....	772,427
1916	.....	2,168,244
1917	.....	2,435,610

Glass, Cylinder, Crown and Common Window.

	Boxes (50 sq. ft.)	Dollars.
1913	.....	434,361
1914	.....	311,329
1915	489,288	1,443,113
1916	894,793	3,123,916
1917	942,648	3,486,596

Quantity not stated prior to 1915.

Glass, Plate.

	Square feet.	Dollars.
1913	165,129	58,830
1914	74,867	35,767
1915	2,730,046	831,727
1916	5,149,512	1,568,151
1917	6,117,935	2,223,316

Glass, All Other.

		Dollars.
1913	.....	2,892,124
1914	.....	2,671,164
1915	.....	2,511,450
1916	.....	5,460,997
1917	.....	5,411,995

Glucose.

	Pounds.	Dollars.
1913	156,365,604	3,682,371
1914	162,680,378	3,766,284
1915	125,434,878	3,103,561
1916	148,523,098	3,772,980
1917	170,025,606	5,960,586

Glue.

	Pounds.	Dollars.
1913	2,544,932	276,619
1914	2,351,770	248,611
1915	2,874,225	298,136
1916	4,946,298	531,329
1917	4,048,104	515,320

Grape Sugar.

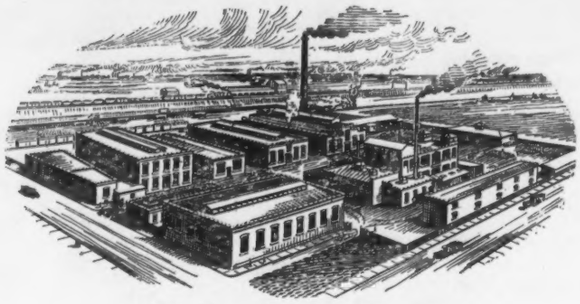
	Pounds.	Dollars.
1913	41,783,642	970,026
1914	36,850,496	799,635
1915	33,027,630	781,672
1916	37,863,084	962,101
1917	44,997,709	1,400,645

Grease, Lubricating.

		Dollars.
1913	.....	2,339,016
1914	.....	2,304,918
1915	.....	2,384,295
1916	.....	3,994,436
1917	.....	2,811,998

Grease, Soap Stock and Other.

		Dollars.
1913	.....	4,844,342
1914	.....	5,046,959
1915	.....	4,266,097
1916	.....	3,156,568
1917	.....	3,405,152



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Hair, Unmanufactured.

		Dollars.
1913	.....	1,449,157
1914	.....	1,085,038
1915	.....	1,402,189
1916	.....	2,038,838
1917	.....	1,451,354

Honey.

		Dollars.
1913	.....	182,252
1914	.....	135,669
1915	.....	114,038
1916	.....	252,487
1917	.....	736,139

Hoofs, Horns, Horn Tips, Strips and Waste.

		Dollars.
1913	.....	102,705
1914	.....	61,180
1915	.....	16,182
1916	.....	37,558
1917	.....	39,804

Hops.

	Pounds.	Dollars.
1913	17,591,195	4,764,713
1914	24,262,896	6,953,529
1915	16,210,443	3,948,020
1916	22,409,818	4,383,929
1917	4,874,876	775,621

Iron, Pig.

	Tons.	Dollars.
1913	287,022	4,141,210
1914	201,995	2,859,880
1915	130,594	2,071,308
1916	286,728	5,846,989
1917	833,523	24,729,424

Lard.

	Pounds.	Dollars.
1913	519,025,384	58,187,336
1914	481,457,792	54,402,911
1915	475,531,909	52,440,133
1916	427,011,338	47,634,376
1917	444,787,521	77,012,830

Lard Compounds and Other Substitutes for Lard.

	Pounds.	Dollars.
1913	67,456,832	5,915,759
1914	58,303,564	5,489,139
1915	69,980,614	6,045,752
1916	52,843,311	5,147,434
1917	56,279,393	8,269,844

Lard, Neutral.

	Pounds.	Dollars.
1913	44,777,692	5,129,899
1914	29,323,786	3,270,236
1915	26,021,054	3,022,321
1916	34,426,586	4,050,397
1917	17,548,259	3,164,172

Lead, Pigs and Bars.

	Pounds.	Dollars.
1914	40,323,662	1,511,800
1915	193,024,221	7,926,604

Stated as following classes after 1915.

Lead, Pigs and Bars, Produced from Domestic Ore.

	Pounds.	Dollars.
1916	153,941,629	9,190,302
1917	166,249,214	12,193,842

Lead, Pigs and Bars, Produced from Foreign Ore.

	Pounds.	Dollars.
1916	52,265,948	2,114,692
1917	21,703,402	1,639,660

Lime.

	Barrels.	Dollars.
1913	284,685	214,543
1914	285,749	200,437
1915	169,078	117,644
1916	258,536	143,182
1917	168,521	126,260

Lime, Acetate.

	Pounds.	Dollars.
1913	80,579,838	2,221,427
1914	68,160,224	1,560,933
1915	24,673,247	486,405
1916	18,804,972	961,645
1917	12,959,222	607,847

Malt.

	Bushels.	Dollars.
1913	370,957	300,480
1914	330,608	270,059
1915	2,153,060	2,301,535
1916	3,682,248	3,881,700
1917	4,330,297	5,868,787

Medical and Surgical Instruments.

		Dollars.
1913	.....	222,050
1914	.....	206,421
1915	.....	360,741
1916	.....	355,170
1917	.....	516,355

Medicines, Patent or Proprietary.

		Dollars.
1913	.....	7,110,493
1914	.....	6,721,978
1915	.....	7,130,379
1916	.....	8,397,971
1917	.....	8,613,202

Metal Polish.

		Dollars.
1913	.....	127,898
1914	.....	162,504
1915	.....	167,277
1916	.....	225,783
1917	.....	214,800

Mica, Unmanufactured.

	Pounds.	Dollars.
1917	12,679	3,896

Not stated prior to 1917.

Mucilage.

		Dollars.
1913	.....	26,238
1914	.....	26,182
1915	.....	14,504
1916	.....	30,149
1917	.....	34,508

Nickel, Nickel Oxide and Matte.

	Pounds.	Dollars.
1915	29,599,612	11,110,699
1916	25,649,995	9,876,403
1917	31,005,606	12,270,854

Oakum.

	Pounds.	Dollars.
1913	1,458,128	66,614
1914	1,260,681	57,205
1915	1,018,286	51,081
1916	1,328,951	89,740
1917	1,541,452	172,529

Oil Cake, Corn.

	Pounds.	Dollars.
1913	76,262,845	1,131,330
1914	59,030,623	909,407
1915	45,026,125	798,206
1916	18,996,490	297,041
1917	15,739,812	289,793

IMPORTS INTO U. S. CALENDAR YEARS, 1915, 1916 AND 1917

	1915		1916		1917	
	Quantity.	Dollars.	Quantity.	Dollars.	Quantity.	Dollars.
Abrasive materials—						
*Corundum ore and grains, tons	.....	.....	826	89,265	1,344	145,639
*Crude artificial abrasives	.....	.....	.....	940,219	.....	1,758,910
*Emery ore, tons	.....	.....	7,511	102,459	650	8,875
*Rottenstone and tripoli	.....	.....	.....	104,837	.....	17,864
*All other	.....	.....	.....	166,360	.....	230,491
Aluminum, crude, scrap, etc., lbs	8,534,834	1,511,988	6,646,385	1,729,298	68,703	18,084
Antimony—						
Ore (antimony contents), lbs	3,374,012	351,540	9,485,423	1,049,806	11,920,443	1,031,998
Matte, regulus, or metal, lbs	17,484,030	3,633,420	19,749,830	5,219,885	35,649,113	4,297,680
*Apparatus, philosophical and scientific	.....	.....	.....	103,365	.....	64,067
Asbestos, unmanufactured, tons	83,541	1,981,483	105,716	3,303,470	119,739	4,521,172
Asphaltum and bitumen, tons	123,436	680,357	131,911	735,102	167,809	993,668
*Blood, dried	.....	.....	.....	229,026	.....	512,721
Bones, hoofs, and horns, unmanufactured	.....	638,145	.....	922,567	.....	1,602,213
Sago, tapioca, etc	.....	1,597,530	.....	2,668,173	.....	4,615,265
Bristles—						
Not sorted, bunched or prepared, lbs	48,767	3,536	123,533	45,231	65,137	79,357
Sorted, bunched, or prepared, lbs	3,522,505	3,350,901	4,415,612	4,351,527	4,051,755	4,499,652
Broom corn, tons	21	1,582	158	24,646	877	149,892
Brushes, feather dusters and hair pencils	.....	1,279,657	.....	1,574,963	.....	2,361,618
Cement—						
Roman, Portland and other hydraulic, 100 lbs	160,390	57,149	6,855	4,924	8,829	6,075
*All other	.....	.....	.....	19,960	.....	31,400
Chalk—						
*Unmanufactured, tons	.....	.....	133,188	112,670	129,693	126,605
*Ground, precipitated, etc	.....	.....	.....	32,714	.....	43,957
Chemicals, drugs, dyes and medicines—						
Acids (except carbolic)—						
Oxalic, lbs	2,059,531	174,290	875,269	421,859	835,450	363,312
All other	.....	890,898	.....	741,338	.....	2,360,623
Ammonia, muriate of, or sal ammoniac, lbs	2,542,592	134,255	1,653,354	123,502	2,146,564	212,558
Argols, or wine lees, lbs	31,901,215	3,767,875	30,141,032	5,103,606	28,467,432	4,714,498
Arsenic, and sulphide of, or orpiment, lbs	3,573,624	154,517	2,180,321	124,844	5,553,045	410,341
Cinchona bark, and alkaloids or salts of—						
Barks of cinchona or other from which quinine may be extracted, lbs	4,044,882	596,578	3,917,636	982,071	2,159,327	574,160
Quinia, sulphate of, and all alkaloids or salts of cinchona bark, ozs	1,442,691	675,619	1,380,001	794,391	1,113,555	450,594
Coal tar distillates, preparations or products—						
Acid, carbolic, lbs	2,055,790	126,092	1,871,343	131,531	664,927	48,910
Alizarin and alizarin dyes, lbs	3,128,205	827,992	45,124	70,291	21,629	82,365
Aniline salts, lbs	261,097	65,319	20	4	.....	.....
Colors or dyes	.....	3,396,594	.....	4,420,147	.....	2,750,708
Dead or creosote oil, gals	34,442,028	2,676,430	46,843,417	3,528,098	9,818,208	787,348
Indigo, natural and synthetic, lbs	7,332,953	4,078,428	3,553,360	6,035,319	.....	.....
*Natural, lbs	.....	.....	229,295	425,788	2,230,492	4,205,200
*Synthetic, lbs	.....	.....	141,990	121,250	1,411,998	896,468
Tar and pitch of coal, bbls	.....	.....	27,716	41,827	12,696	22,784
All other coal-tar distillates, etc	.....	447,634	.....	742,491	.....	738,558
Extracts for tanning—						
Quebracho, lbs	82,182,141	3,145,819	67,088,978	5,323,096	108,993,077	7,192,666
All other, lbs	5,296,142	272,242	3,216,087	258,558	2,875,299	170,788
Fusel oil or amylic alcohol, lbs	3,738,232	951,278	1,991,646	751,558	973,754	392,429
Glycerin, crude, lbs	15,616,900	1,976,332	7,026,044	2,079,196	2,964,953	1,114,312
Gums—						
Camphor, crude and natural, lbs	3,712,328	989,923	5,654,281	1,570,735	5,512,807	1,849,674
Camphor, refined and synthetic, lbs	1,205,287	390,366	3,911,072	1,190,498	3,108,240	1,664,106
Chicle, lbs	7,916,893	2,903,018	7,250,336	3,198,153	6,117,992	2,073,484
Copal, kauri and damar, lbs	32,227,509	2,772,833	43,843,328	3,680,361	39,891,803	3,447,916
Gambier or terra japonica, lbs	9,663,963	461,042	13,780,169	1,042,342	11,321,569	1,145,031
Shellac, lbs	26,845,107	3,010,290	31,132,320	5,075,885	27,460,757	9,040,243
All other	.....	1,603,949	.....	2,407,790	.....	2,234,229
Iodine, crude or resublimed, lbs	612,926	1,332,387	2,033,068	5,158,265	609,641	1,363,468
Lactarens or casein, lbs	7,656,680	514,206	12,319,559	1,570,076	13,078,223	1,992,431
Licorice root, lbs	31,049,615	1,244,763	59,132,314	2,321,381	33,460,490	1,196,576
Lime, chloride of, or bleaching powder, lbs	7,564,473	102,570	1,605,036	52,628	4,000	140
Lime, citrate of, lbs	6,310,327	1,113,569	8,542,880	1,982,823	6,075,714	1,425,484
Magnesite, not purified, lbs	55,146,407	399,866	18,589,704	204,183	7,925,879	232,098
Medicinal preparations	.....	243,500	.....	392,629	.....	373,152
Opium, containing 9% and over of morphia, lbs	351,955	1,735,435	90,608	648,063	124,764	1,538,803
Potash (see also fertilizers)—						
Carbonate of, including crude or black salts, lbs	9,434,590	318,308	2,992,753	262,878	8,703,959	1,385,653
Cyanide of, lbs	872,207	134,210	2,705	803	104,316	76,303
Hydrate of, containing not over 15% of caustic soda, lbs	2,037,942	100,369	48,700	16,754	61,097	26,013
Nitrate of, or saltpeter, crude, lbs	127,270	28,095	11,537,033	1,519,375	9,217,004	667,269
All other	2,214,361	232,791	170,064	106,033	2,143,476	737,894
Soda—						
Cyanide of, lbs	4,178,058	650,559	483,811	102,663	1,604,117	808,604
Nitrate of, tons	772,190	22,959,997	1,218,423	38,131,962	1,555,839	60,283,900
All other salts of	.....	450,383	.....	784,334	.....	724,347
Sulphur or brimstone, tons	24,647	405,990	21,510	364,787	973	20,176
Sumac, ground or unground, lbs	14,553,174	349,549	17,454,996	472,590	12,906,647	419,692
Vanilla beans, lbs	901,133	1,442,674	801,922	1,734,905	916,378	1,669,541
All other chemicals, etc	.....	12,523,602	.....	18,805,915	.....	18,814,612
Clays or earths—						
China clay or kaolin, tons	186,414	1,151,551	226,632	1,325,647	214,505	1,310,349
Common blue and bauxite, crude, tons	11,339	79,676	2,234	12,137	7,760	29,433
All other, tons	40,325	257,571	54,585	308,066	39,947	307,748
Cocoa, crude, lbs	230,525,001	31,318,876	242,617,054	33,926,029	390,047,655	41,415,354
Copper—						
Ore (copper contents), lbs	92,058,517	10,721,948	124,878,905	19,284,011	116,500,532	19,790,916
Matte and regulus (copper contents), lbs	19,531,737	2,798,076	17,155,075	3,382,911	21,048,943	5,562,565
Concentrate (copper contents), lbs	2,741,187	401,859	32,753,874	7,132,659	38,197,632	9,297,352
Cork—						
Wood or bark, unmanufactured	.....	2,411,521	.....	3,509,934	.....	3,915,931
Manufactures of	.....	1,313,524	.....	1,504,915	.....	2,075,066
Dyewoods in a crude state—						
Logwood, tons	60,958	832,196	186,816	6,097,576	61,735	1,519,878
All other, tons	23,166	357,903	15,076	340,727	14,335	364,322
*Eggs, dried or frozen, lbs	.....	.....	7,669,350	1,226,982	17,268,379	3,559,504
Fertilizers—						
Ammonia, sulphate of, tons	32,477	1,934,625	12,962	954,815	7,263	649,120
Bone dust, bone ash and bone meal, tons	21,322	540,197	18,194	487,857	10,519	308,497
Guano, tons	9,974	220,866	12,997	378,109	6,500	140,101
Kainit, tons	6,674	95,440	36	1,173	.....	.....
Manure salts, tons	13,947	207,674	1,104	21,273	190	8,872
Potash, n. e. s.—						
Muriate of, tons	57,744	2,297,149	1,161	348,961	737	196,585
Sulphate of, tons	11,344	663,399	1,514	81,684	203	21,702
All other substances used only as fertilizers	.....	2,922,914	.....	3,223,724	.....	4,456,363
*Fish sounds, lbs	.....	.....	446,645	102,033	331,558	82,401
*Fluorspar, tons	.....	.....	10,499	52,976	12,156	114,598
Cocoanut meat, broken, or copra not shredded, desiccated or prepared, lbs	108,294,331	3,756,526	158,770,903	7,735,046	366,510,360	19,167,058
Gelatin, unmanufactured, lbs	2,613,250	820,968	1,031,659	282,903	826,115	304,249
Glass and glassware—						
Bottles, vials, demijohns, carboys and jars	.....	657,299	.....	865,437	.....	605,067
Bottles, decanters, and other glassware cut or ornamented	.....	361,546	.....	295,244	.....	275,094
Optical instruments, including lenses and spectacles	.....	172,963	.....	159,749	.....	120,377
Sheet and plate glass—						
Cylinder, crown, and common window glass, unpolished, lbs	2,807,762	282,798	3,207,681	350,742	1,044,645	141,750
Plate glass, cast, polished, unsilvered, sq. ft	15,865	7,305	11,869	10,160	3,504	6,503
Plates or disks, rough-cut or unwrought, for optical purposes	.....	387,331	.....	253,856	.....	223,805
All other	.....	1,035,771	.....	479,049	.....	564,545
Glue and glue size, lbs	6,523,921	596,974	2,063,564	184,371	6,755,192	1,048,328
Grease and oils, n. e. s.—						
Sulphur oil or olive foots, lbs	10,950,237	777,951	14,245,773	1,251,729	8,307,868	820,830
All other	.....	651,066	.....	752,974	.....	1,614,196
Hair—						
Horse, lbs	4,324,905	1,484,131	7,194,325	2,484,910	5,798,374	1,907,371
Other animal, lbs	9,698,231	832,239	8,338,861	904,001	5,738,594	804,852
Human, uncleaned, lbs	725,477	267,673	1,112,209	555,464	1,765,906	732,344
Hide cuttings, raw, and other glue stock, lbs	.....	1,048,375	27,497,535	1,104,486	34,499,825	1,560,673
*Honey, gals	.....	.....	222,020	107,845	533,229	484,450
Hops, lbs	6,767,160	1,540,533	630,669	144,700	193,630	57,077
India rubber, and substitutes, unmanufactured—						
Balata, lbs	2,302,684	864,694	2,748,207	1,265,896	3,193,387	1,607,343
Guayule gum, lbs	4,966,464	1,445,453	2,537,167	693,251	4,852,531	1,487,978
Gutta-jolatong, lbs	21,230,028	979,786	24,792,820	1,236,502	24,414,867	1,144,948
Gutta-percha, lbs	2,231,246	258,948	3,176,010	349,727	1,476,426	289,802
India rubber, lbs	221,481,921	111,031,144	270,090,205	159,745,475	405,638,278	233,220,904
Iron ore, tons	1,341,281	4,181,645	1,325,736	4,566,514	971,663	3,654,842
Pig iron—						
Ferro-manganese, tons	.....	.....	90,928	9,240,528	45,381	6,107,379
Ferrosilicon, tons	5,226	310,130	6,739	384,258	9,740	691,684
All other, tons	84,610	3,798,050	37,682	615,082	21,665	1,073,042
Lead ore (lead contents), lbs	18,185,140	605,075	35,086,100	1,428,714	41,292,876	2,267,799
Lead, bullion and base bullion (lead contents), lbs	83,986,988	2,826,754	24,262,435	1,504,308	103,664,970	6,612,181
Lead, pigs, bars and old, lbs	819,282	28,154	11,310,718	761,537	11,585,974	649,205
Chamois skins	.....	55,722	.....	165,969	.....	155,446
Matches, friction or lucifer	.....	833,529	.....	1,543,328	.....	2,334,060

Acid-Proof Chemical Stoneware

For Every Purpose

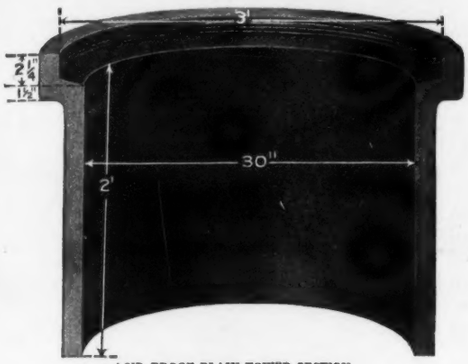
A Stoneware that is Acid-Proof and Vitrified All Through **Our Ware Is Not Dependent Upon a Glaze, Enamel or Veneer**

IT IS THE BODY ITSELF

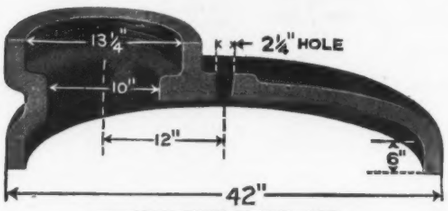
Withstands the action of Acids, Alkalis and Chemicals, strong and weak, hot or cold

ACID-PROOF DISTRIBUTING PLATE
Made in many sizes and designs.

ACID-PROOF TOWER DISTRIBUTOR
Made to fit any size or bore tower from 12-in. up to 42-in.



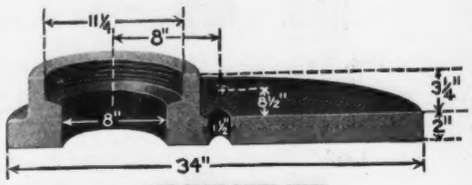
ACID-PROOF PLAIN TOWER SECTION
Notice heavy grooved sockets. We make tower pipe in any bore from 12-in. up to 42-in.



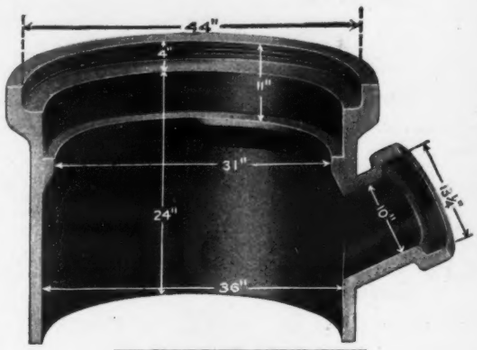
ACID-PROOF TOWER OR LUTE COVER
Made in any size with outlets and inlets to meet requirements.

We make every description of acid-proof chemical stoneware from special pieces to complete plants

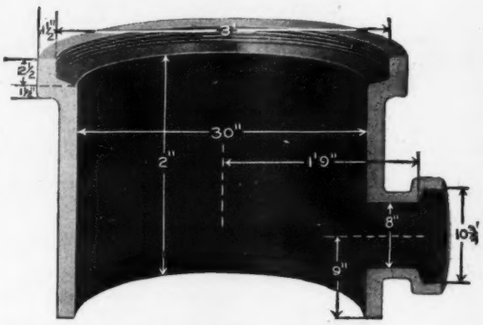
All Guaranteed Acid-Proof and Vitrified Throughout—Yet not brittle and fragile like glass, but strong and tough like Granite



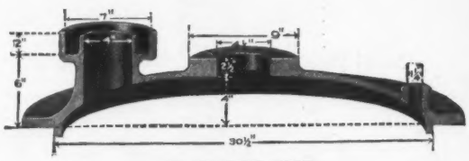
ACID-PROOF TOWER COVER
Used with internal distributing plate and doing away with a Y or Tee outlet top section.



ACID-PROOF TOWER BOTTOM SECTION
Showing 10-in. Y and Ring for supporting perforated plate, or as top section for distributing plate.



ACID-PROOF TOWER TOP SECTION
Or can be used as inlet bottom section by using cascade.



ACID-PROOF JAR COVER
Made to fit any size jar with any size or design holes.

Our ware is not the cheapest, nor is it fancy—but it is made of a body and built so as to give long and dependable service under severe and various working conditions.

Made in America by Americans who know how.

It is the Body Itself

We carry a large stock of Acid-Proof Brick and other tower packing.

MAURICE A. KNIGHT, Factory and Office: Kelley Avenue East Akron, O.

Oil Cake, Cottonseed.

	Pounds.	Dollars.
1913	1,128,092,367	15,225,798
1914	799,974,252	11,007,441
1915	1,222,699,889	15,432,126
1916	980,664,572	14,749,489
1917	864,862,375	15,059,920

Oil Cake, Flaxseed or Linseed.

	Pounds.	Dollars.
1913	838,119,654	12,982,423
1914	662,868,639	9,650,379
1915	524,794,434	9,048,061
1916	640,916,204	11,935,130
1917	536,976,419	10,255,355

Oil Cake, All Other.

	Pounds.	Dollars.
1913	6,886,270	104,701
1914	8,484,936	100,445
1915	9,900,878	126,414
1916	28,876,367	410,166
1917	21,558,676	398,681

Oilcake Meal, Cottonseed.

	Pounds.	Dollars.
1915	256,365,126	3,474,244
1916	77,256,997	1,149,478
1917	285,297,316	5,286,091

Not stated prior to 1915.

Oil, Animal, Fish, Except Whale.

	Gallons.	Dollars.
1913	1,901,953	501,227
1914	448,366	125,575
1915	88,880	29,802
1916	146,643	60,411
1917	123,962	82,159

Oil, Animal, Lard.

	Gallons.	Dollars.
1913	154,983	113,665
1914	110,199	87,364
1915	104,019	111,637
1916	419,969	308,642
1917	331,269	322,813

Oil, Animal, Oleo.

	Pounds.	Dollars.
1913	92,849,757	10,866,253
1914	97,017,065	10,156,665
1915	80,481,496	9,341,188
1916	102,645,914	12,519,115
1917	67,113,421	11,067,505

Oil, Animal, Not Otherwise Specified.

	Gallons.	Dollars.
1913	1,603,325	970,717
1914	891,035	609,294
1915	559,197	405,635
1916	655,587	492,964
1917	430,563	398,114

Oils, Mineral, Crude.

	Gallons.	Dollars.
1913	195,642,935	7,750,767
1914	146,477,342	6,812,672
1915	152,514,129	4,911,634
1916	163,734,200	5,754,279
1917	176,368,675	7,162,550

Oil, Mineral, Illuminating.

	Gallons.	Dollars.
1913	1,048,894,297	66,189,286
1914	1,157,283,310	74,500,162
1915	886,316,740	53,607,082
1916	823,164,882	54,288,788
1917	835,114,403	54,662,094

Oil, Mineral, Lubricating and Heavy Paraffin.

	Gallons.	Dollars.
1913	213,671,499	29,574,410
1914	196,884,696	27,852,959
1915	214,429,099	28,499,786
1916	250,392,768	37,451,607
1917	271,028,546	48,649,557

Oils, Mineral, Naphthas, Etc., Gasoline.

	Gallons.	Dollars.
1913	81,698,917	10,831,490
1914	151,611,537	21,699,475
1915	156,860,666	17,603,317
1916	100,148,554	16,297,561
1917	226,185,730	46,936,510

Oils, Mineral, Naphthas, Etc., All Other.

	Gallons.	Dollars.
1913	101,821,572	14,269,878
1914	40,840,730	5,653,210
1915	94,335,128	10,296,928
1916	194,644,803	29,472,233
1917	199,517,400	41,034,753

Oils, Mineral, Residuum, Etc., Gas Oil and Fuel Oil.

1914	475,143,205	13,747,863
1915	672,931,878	18,543,976
1916	897,853,433	24,770,296
1917	1,040,671,713	32,473,872

Not separately stated prior to 1914.

Oils, Mineral, Residuum, Etc., Gas Oil and Fuel for Vessels Engaged in Foreign Trade.

	Barrels.	Dollars.
1915	2,898,393	2,567,017
1916	4,532,822	4,195,806
1917	5,924,460	6,418,474

(Not stated prior to 1915.

Oils, Mineral, Residuum, Etc., All Other.

	Gallons.	Dollars.
1913	27,513,568	498,237
1914	113,370,245	1,907,715
1915	9,952,970	230,552
1916	13,538,335	388,175
1917	551,967	33,813

Oil, Corn.

	Pounds.	Dollars.
1913	19,739,622	1,292,009
1914	18,281,576	1,307,204
1915	17,789,635	1,302,159
1916	8,967,826	770,076
1917	8,779,760	998,105

Oil, Cottonseed.

	Pounds.	Dollars.
1913	315,232,802	20,736,975
1914	192,963,079	13,843,178
1915	318,366,525	21,872,94[illegible]
1916	266,529,960	22,659,80[illegible]
1917	158,985,642	19,878,658

Oil, Linseed.

	Gallons.	Dollars
1913	1,733,925	874,46[illegible]
1914	239,198	134,54[illegible]
1915	1,212,133	660,08[illegible]
1916	714,120	479.23
1917	1,201,746	1,117,855

Oils, Vegetable, All Other, Fixed or Expressed.

		Dollars
1913	.....	420,36[illegible]
1914	.....	338,96[illegible]
1915	.....	1,198,85[illegible]
1916	.....	2,230,00[illegible]
1917	.....	3,003,875

	1915 Quantity.	1915 Dollars.	1916 Quantity.	1916 Dollars.	1917 Quantity.	1917 Dollars.
Metals and metal compositions, n. e. s.—						
Chromate of iron or chromic ore, tons	76,455	780,061	115,856	1,548,402	72,063	1,098,659
*Cobalt and cobalt ore, and zaffer, tons	.....	.....	136,870	175,236	225,171	369,960
Ferro alloys, n. e. s., tons	56	12,942	165	172,860	96	8,857
*Iridium and osmium, ozs., troy	.....	.....	10,263	650,856	5,566	547,652
Manganese, oxide and ore, tons	313,085	2,633,286	576,321	8,666,179	629,972	10,262,949
*Tungsten-bearing ore, tons	.....	.....	3,635	7,353,691	4,357	4,467,606
Mica—						
Unmanufactured, * lbs	779,922	244,292	1,151,494	471,204	760,134	419,815
*Cut, split and manufactured	.....	.....	.....	655,067	.....	948,205
*Monazite sand and thorite, lbs	.....	.....	1,221,399	120,077	4,598,926	267,898
Nickel ore and matte (nickel contents), lbs	56,352,582	7,615,999	72,611,492	9,889,122	75,510,793	9,612,400
*Oil cake, lbs	.....	.....	44,913,239	522,502	43,188,260	535,687
Oils—						
Animal—						
Cod and cod liver, gals	1,613,859	760,780	1,463,014	1,187,786	2,215,693	2,185,071
All other	1,243,318	411,773	3,116,635	1,251,650	3,123,514	1,477,306
Mineral—						
Crude, gals	761,852,180	10,387,553	873,468,333	12,574,266	1,265,320,675	16,255,279
Refined—						
Benzine, gasoline and naphtha, gals	1,146,678	35,756	2,703,375	185,286	10,494,619	1,411,453
All other, gals	706,840	137,319	14,662,142	1,227,711	48,342,521	2,937,874
Vegetable—						
Expressed—						
Chinese nut, gals	4,530,091	1,483,515	7,686,593	3,977,141	5,478,798	4,006,143
Cocoa butter or butterine, lbs	24,561	7,366	558,148	181,957	815	193
Cocoanut, lbs	63,165,102	5,334,271	64,349,208	6,816,685	163,091,008	18,852,789
Cottonseed, lbs	11,675,427	488,241	16,597,785	954,714	13,622,028	1,211,880
Linseed or flaxseed, gals	88,462	49,475	103,753	71,206	84,408	60,578
Olive, fit only for manufacturing or mechanical purposes, gals	631,501	438,628	844,596	681,423	596,815	569,534
Olive, edible, gals	6,368,872	8,105,834	7,382,353	10,407,608	6,807,280	9,441,254
Palm, lbs	84,399,130	2,160,208	29,270,063	2,457,376	34,257,396	3,561,025
Palm kernel, lbs	5,312,367	391,513	4,323,735	412,707	306	31
Peanut, gals	824,581	650,814	2,089,801	1,173,846	3,653,938	2,672,506
Rapeseed, gals	1,545,739	857,302	2,690,755	1,508,604	1,350,892	981,927
Soya bean, lbs	21,336,213	931,791	145,409,269	8,212,738	264,925,782	21,191,262
All other	.....	153,292	.....	632,402	.....	876,500
Distilled and essential—						
Birch tar and cajeput	.....	11,864	.....	27,089	.....	24,822
Lemon, lbs	476,161	418,588	623,831	493,610	569,936	434,997
All other	.....	2,398,084	.....	2,815,016	.....	3,915,905
Oleo stearine, lbs	1,718,473	153,987	648,675	53,282	5,555,448	936,561
Paints, colors and varnishes	.....	1,566,340	.....	2,248,645	.....	1,235,104
*Paraffin (except oil), lbs	.....	.....	9,258,115	510,689	9,708,604	638,700
Perfumeries, cosmetics and all toilet preparations	.....	2,699,988	.....	3,371,363	.....	3,851,224
*Plaster rock, or gypsum, crude, unground or calcined, tons	.....	.....	237,356	347,385	227,758	375,152
Platinum—						
Unmanufactured, ozs., troy	55,729	2,077,536	41,236	2,506,531	26,146	2,095,390
Manufactures of—						
Ingots, bars, plates, etc., ozs., troy	5,708	262,940	12,248	631,865	4,170	319,383
Vases, retorts, etc., for chemical uses	.....	71,532	.....	18,923	.....	382
Plumbago, or graphite, tons	20,605	2,241,163	38,408	7,278,884	38,044	8,961,988
*Diamonds, glaziers' and engravers, unset and miners'	.....	.....	.....	840,735	.....	1,098,102
*Rennets, raw or prepared	.....	.....	.....	24,681	.....	21,884
Salt, 100 lbs	2,471,520	366,475	2,439,339	342,588	1,318,800	280,135
Seeds—						
Castor beans or seeds, bush	855,315	933,628	1,034,822	1,560,122	1,041,017	1,829,481
Flaxseed or linseed, bush	14,696,623	18,678,658	13,098,004	20,438,408	9,394,287	25,445,704
Soap—						
Castile, lbs	3,522,342	310,687	2,737,827	326,469	2,080,729	285,225
All other	.....	282,189	.....	269,741	.....	271,283
Spices—						
Cassia and cassia vera, unground, lbs	6,288,260	339,948	10,724,813	753,861	8,951,396	824,661
Ginger root, unground, not preserved, lbs	4,329,569	226,994	6,079,503	477,289	3,793,293	362,955
Pepper, black or white, unground, lbs	33,198,661	3,427,205	32,605,823	4,400,211	35,829,674	5,400,473
All other, lbs	22,498,013	2,432,062	27,840,795	3,535,419	26,232,042	3,785,380
Sponges	.....	510,443	.....	605,592	.....	639,905
Starch, lbs	2,536,151	97,339	5,538,309	266,583	25,347,956	1,309,169
Sulphur ore as pyrites, containing in excess of 25 per cent. of sulphur, tons	974,616	4,817,977	1,244,519	6,728,318	967,340	5,921,487
*Talc, ground, or prepared, lbs	.....	.....	33,364,896	218,180	32,263,255	257,454
Tanning materials, crude—						
Mangrove bark, tons	15,897	411,490	20,014	563,805	4,203	107,844
Quebracho wood, tons	81,251	1,182,152	79,048	1,205,398	68,592	1,206,018
All other	.....	479,743	.....	932,863	.....	623,023
Tin—						
*Ore, tons	.....	.....	8,307	4,036,821	8,084	4,743,000
Bars, blocks, pigs, or grain, or granulated, lbs	115,636,332	33,736,909	138,073,293	51,803,384	143,637,037	63,629,321
Wax—						
*Beeswax, lbs	.....	.....	1,955,646	556,074	2,858,190	994,159
Mineral, lbs	2,845,304	214,495	3,047,834	200,377	899,405	90,510
Vegetable, lbs	6,555,069	1,088,278	7,995,825	1,340,558	8,001,286	2,050,335
Zinc—						
Ore and calamine (zinc contents), lbs	115,337,046	4,510,546	296,293,158	12,121,385	142,494,169	4,374,058
Blocks and pigs, or old, lbs	1,808,964	131,468	1,368,560	119,000	513,153	25,849
Zinc dust, lbs	1,712,373	179,825	1,867,702	333,344	801,337	88,996

* Not separately stated prior to 1916.

EXPORTS FROM THE U. S. CALENDAR YEARS, 1915, 1916 AND 1917

	1915 Quantity.	1915 Dollars.	1916 Quantity.	1916 Dollars.	1917 Quantity.	1917 Dollars.
Abrasives—						
Wheels, emery and other	.....	1,200,421	.....	2,240,227	.....	4,861,600
All other	.....	1,403,796	.....	2,065,951	.....	1,941,512
*Aluminum, ingots, and alloys, lbs	.....	.....	.....	.....	9,470,206	4,269,643
Asbestos, ore and unmanufactured, tons	.....	.....	279	6,133	810	103,807
Asphaltum, unmanufactured, tons	38,203	735,952	36,403	759,769	27,239	617,343
Bark for tanning, tons	.....	.....	4,742	113,166	908	26,233
Bauxite concentrates, tons	16,082	717,186	18,032	987,454	21,791	1,323,926
Blacking and polishes	.....	649,278	.....	903,052	.....	1,057,231
Bones, hoofs and horns, unmanufactured	.....	29,316	.....	39,673	.....	173,159
Broom corn, tons	4,332	444,303	3,382	558,097	3,150	941,582
Brushes	.....	962,814	.....	1,917,747	.....	910,746
Candles, lbs	5,302,364	497,333	6,465,843	652,961	6,469,182	842,504
Celluloid and manufactures of	.....	1,402,044	.....	2,626,685	.....	3,361,808
Cement, hydraulic, bbls	2,565,031	3,361,451	2,563,976	3,828,231	2,586,350	5,329,588
Chalk, manufactures of	.....	.....	.....	103,995	.....	166,281
Chemicals, drugs, dyes, and medicines—						
Acids—						
Carbolic, lbs	.....	.....	.....	.....	7,298,380	3,476,521
Nitric, lbs	.....	.....	.....	.....	485,863	48,060
Picric, lbs	.....	.....	.....	.....	26,609,548	17,255,019
Sulphuric, lbs	77,839,429	998,249	66,463,501	1,847,995	63,642,930	1,006,125
All other	.....	9,005,398	.....	43,167,469	.....	30,931,915
Alcohol, wood, gals	1,230,011	832,242	1,242,829	814,252	1,126,891	1,177,322
Baking powder, lbs	3,550,280	856,474	4,544,881	932,363	5,993,756	1,587,425
Calcium carbide, lbs	37,387,035	1,158,609	40,862,419	1,228,958	31,054,854	1,065,317
Coal tar distillates, n. e. s.—						
Bengol, lbs	.....	.....	.....	.....	15,860,496	1,446,250
All other	.....	.....	.....	.....	.....	2,855,394
Copper, sulphate of, or blue vitriol, lbs	13,938,819	690,966	19,469,565	2,803,533	29,067,694	3,038,345
Dyes and dyestuffs	.....	2,510,650	.....	2,254,260	.....	.....
†Aniline dyes	.....	.....	.....	.....	.....	3,502,218
†Logwood extract	.....	.....	.....	.....	.....	1,404,709
†All other	.....	.....	.....	.....	.....	4,046,745
Extracts for tanning	.....	4,210,398	.....	5,593,524	.....	3,372,417
Formaldehyde (formalin)	.....	.....	.....	.....	.....	394,609
Glycerin, lbs	.....	.....	.....	.....	9,615,000	4,747,923
Infants' food	.....	.....	.....	.....	.....	763,066
Lime—						
Acetate of, lbs	19,767,874	552,862	17,192,090	1,034,694	14,378,032	655,365
Chloride of, or bleaching powder, lbs	.....	.....	.....	.....	8,848,789	421,397
Medicinal and pharmaceutical preparations	.....	8,110,672	.....	8,202,964	.....	9,740,312
Petroleum jelly	.....	1,034,254	.....	1,241,144	.....	1,246,301
Potash—						
Chlorate, lbs	.....	.....	.....	.....	1,054,986	475,434
All other	.....	.....	.....	.....	.....	638,768
Roots, herbs and barks—						
Ginseng, lbs	210,325	1,538,739	261,705	1,735,187	205,384	1,397,067
All other	.....	756,467	.....	647,182	.....	955,135
Soda, salts, and preparations of—						
Caustic, lbs	.....	.....	.....	.....	89,994,973	5,832,652
Sal soda, lbs	.....	.....	.....	.....	7,442,608	99,821
Silicate of soda, lbs	.....	.....	.....	.....	14,560,624	217,663
Soda ash, lbs	.....	.....	.....	.....	98,421,008	2,884,559
All other salts of	.....	7,111,187	.....	17,003,998	.....	4,030,196
Sulphur or brimstone, tons	37,271	724,679	128,755	2,505,857	152,833	3,504,661
Washing powder and fluid, lbs	12,892,431	583,590	5,048,843	236,057	4,453,250	250,910
All other chemicals, etc	.....	39,773,260	.....	68,385,141	.....	62,331,607
Chewing gum	.....	.....	.....	942,511	.....	1,403,888
Clays—						
Fire, tons	.....	.....	40,850	144,552	48,235	268,036
All other, tons	.....	.....	24,808	154,163	28,070	178,923
Coal tar, bbls	.....	.....	48,558	96,219	72,769	184,143
Copper—						
Ore (copper contents), lbs	1,556,189	290,913	4,818,828	1,006,826	4,969,033	1,370,878
Concentrates, matte, and regulus (copper contents), lbs	311,442	55,005	965,940	232,241	821,477	205,388
*Cork, manufactures of	.....	.....	.....	532,674	.....	655,765
Cotton mill waste, lbs	44,789,174	3,051,899	47,420,203	4,894,771	62,551,212	9,015,329

John C. Wiarda & Co.

ESTABLISHED 1871

Manufacturers, Importers *and* Exporters *of* Industrial Chemicals

ACID, BORACIC
ACID, HYDROFLUORIC
ACID, OXALIC
ACID, SULPHURIC
AMMONIA, AQUA
AMMONIA, CARBONATE
AMMONIA, FLUORIDE
AMMONIA, MURIATE
AMMONIA, SULPHATE
ANILINE OIL
ANILINE SALT
ANTIMONY
ARSENIC
BARIUM CARBONATE
BARIUM CHLORIDE
BARIUM FLUORIDE
BARIUM HYDRATE
BARIUM NITRATE
BARIUM SULPHATE, PULP AND POWDER (Blanc Fixe)
BLEACHING POWDER
BLUE VITRIOL
BONE ASH FOR ALL PURPOSES
BORAX, REFINED
CHROME OXIDE
COPPER CARBONATE
COPPER OXIDE
COPPERAS
EPSOM SALT
FELD SPAR
FLUORSPAR
GLASS, GROUND
LITHOPONE
MAGNESIUM COMPOUNDS
MANGANESE
NICKEL SALTS
POTASH, BICHROMATE
POTASH, CAUSTIC
POTASH, CARBONATE
POTASH, CHLORIDE
POTASH, PRUSSIATE
POTASH, SULPHURET
POWDER BLUE
PUMICE
SAL AMMONIAC
SALT CAKE
SODA, ASH
SODA, BICARBONATE
SODA, BICHROMATE
SODA, BISULPHITE
SODA, CAUSTIC
SODA, FLUORIDE
SODA, NITRITE
SODA, PRUSSIATE
SODA, SAL
SODA, SULPHIDE
ZINC CARBONATE
ZINC DUST
ZINC OXIDE
ZINC SULPHATE

WORKS AND OFFICE - - PROVOST and FREEMAN STREETS
WAREHOUSE - - - - HURON, PROVOST and INDIA STREETS

BROOKLYN, N. Y.

Oil, Peppermint.

	Pounds.	Dollars.
1913	144,663	296,551
1914	117,809	397,055
1915	184,981	384,596
1916	154,096	323,070
1917	100,332	218,627

Oils, Vegetable, All Other, Volatile.

		Dollars.
1913	.....	325,040
1914	.....	230,557
1915	.....	413,104
1916	.....	705,037
1917	.....	1,062,899

Oleomargarine, Imitation Butter.

	Pounds.	Dollars.
1913	2,987,582	311,482
1914	2,532,821	263,453
1915	5,252,183	617,032
1916	5,426,221	640,486
1917	5,651,267	901,659

Optical Instruments.

		Dollars.
1915	.....	1,018,016
1916	.....	2,593,509
1917	.....	2,945,920

Paints, Dry Colors, Lampblack.

		Dollars.
1913	.....	505,748
1914	.....	421,548
1915	.....	368,825
1916	.....	521,463
1917	.....	917,303

Paints, Dry Colors, All Other.

		Dollars.
1913	.....	785,907
1914	.....	699,836
1915	.....	1,072,736
1916	.....	1,591,913
1917	.....	1,810,393

Paints, Ready Mixed.

	Gallons.	Dollars.
1913	961,945	1,211,580
1914	852,910	1,096,335
1915	703,494	884,700
1916	1,099,721	1,384,226
1917	1,216,180	1,756,226

Paints, White Lead.

	Pounds.	Dollars.
1913	15,736,488	944,205
1914	16,845,154	1,013,506
1915	19,700,810	1,070,646
1916	29,107,449	1,861,730
1917	21,390,208	1,944,203

Paints Not Elsewhere Specified, Including Crayons.

		Dollars.
1913	.....	1,802,049
1914	.....	1,779,863
1915	.....	1,527,494
1916	.....	3,259,539
1917	.....	4,484,629

Paraffin and Paraffin Wax.

	Pounds.	Dollars.
1913	290,678,861	9,679,273
1914	186,357,728	6,516,338
1915	330,374,056	10,589,843
1916	360,650,114	12,873,260
1917	348,743,903	16,021,811

Paste.

		Dollars.
1913	.....	69,062
1914	.....	68,831
1915	.....	91,522
1916	.....	298,537
1917	.....	299,585

Perfumeries, Cosmetics and All Toilet Preparations.

		Dollars.
1913	.....	1,441,982
1914	.....	1,620,872
1915	.....	1,715,059
1916	.....	2,903,063
1917	.....	3,618,604

Petroleum Jelly.

		Dollars.
1913	.....	536,637
1914	.....	661,889
1915	.....	838,842
1916	.....	1,099,315
1917	.....	988,767

Plaster of Paris.

		Dollars.
1913	.....	15,723
1914	.....	14,799
1915	.....	12,883
1916	.....	12,434
1917	.....	28,144

Platinum, Unmanufactured.

	Ounces, troy.	Dollars.
1913	1,299	57,071
1914	273	12,977
1915	1,397	53,266
1916	1,083	92,388
1917	3,254	207,662

Platinum, Manufactures of.

		Dollars.
1913	.....	126,013
1914	.....	71,172
1915	.....	27,101
1916	.....	82,929
1917	.....	77,265

Plumbago or Graphite, Unmanufactured.

	Pounds.	Dollars.
1912	3,935,884	285,597
1913	4,503,569	321,679
1914	5,376,880	387,075
1915	2,324,081	152,446
1916	936,869	46,907
1917	2,527,520	165,661

Plumbago or Graphite, Manufactures of.

		Dollars.
1913	.....	175,583
1914	.....	269,499
1915	.....	368,333
1916	.....	845,729
1917	.....	1,203,987

Quicksilver.

	Pounds.	Dollars.
1913	40,410	21,886
1914	64,190	32,241
1915	222,927	155,089
1916	232,763	272,086
1916	232,763	274,086
1917	1,017,944	1,071,825

Roofing Felt.

		Dollars.
1913	.....	1,427,695
1914	.....	1,029,127
1915	.....	880,944
1916	.....	1,552,535
1917	.....	3,165,142

Roots, Herbs and Barks, Crude, Not Mixed.

		Dollars.
1913	.....	424,312
1914	.....	513,071
1915	.....	470,690

	1915 Quantity.	1915 Dollars.	1916 Quantity.	1916 Dollars.	1917 Quantity.	1917 Dollars.
Dental goods—						
Teeth	.....	190,042	.....	222,718	.....	296,493
All other	.....	1,630,313	.....	1,842,656	.....	1,808,402
Egg yolks, canned eggs, etc	.....	.....	.....	79,237	.....	171,112
Fertilizers:						
Phosphate rock, ground or unground—						
High-grade hard rock, tons	34,572	331,524	28,631	236,948	12,431	113,531
Land pebble, tons	218,942	1,269,659	214,358	863,078	137,610	547,278
All other, tons	377	2,668	854	8,915	16,473	187,677
*Superphosphates, tons	.....	.....	.....	.....	5,479	628,103
All other fertilizers, tons	114,205	2,785,804	149,121	5,007,967	168,536	5,181,510
Flavoring extracts and fruit juices	.....	.....	.....	573,800	.....	731,019
Glass and glassware—						
Bottles, demijohns, carboys and jars	.....	1,501,460	.....	2,491,366	.....	2,542,904
*Chemical glassware	.....	.....	.....	.....	.....	65,336
Common window glass (50 sq. ft.), boxes	686,513	2,302,687	1,169,142	4,158,705	728,778	2,891,455
*Cut or engraved glassware	.....	.....	.....	.....	.....	96,088
Plate glass, unsilvered, sq. ft	5,023,593	1,500,727	5,604,453	1,868,117	5,941,703	2,369,945
All other	.....	3,961,767	.....	5,941,383	.....	4,044,646
Glucose and grape sugar—						
Glucose (corn syrup), lbs	151,487,376	4,107,547	136,379,198	3,295,823	152,076,927	7,153,670
Grape sugar (corn sugar), lbs	36,842,636	945,238	38,684,528	993,478	26,822,126	965,658
Glue, lbs	3,774,010	383,950	5,147,060	586,188	4,127,702	637,528
Grease—						
Lubricating	.....	3,275,552	.....	3,546,816	.....	3,021,943
Soap stock and other	.....	4,064,456	.....	3,045,921	.....	2,051,379
Hair, animal, unmanufactured	.....	1,466,723	.....	2,012,724	.....	1,583,387
Honey	.....	.....	.....	225,817	.....	1,888,672
Hops, lbs	20,864,260	4,797,843	13,505,655	2,113,776	4,118,254	917,650
Druggist's rubber sundries	.....	.....	.....	.....	.....	469,284
Ink—						
Printers'	.....	437,862	.....	793,777	.....	829,493
All other	.....	202,127	.....	344,905	.....	422,717
Instruments for scientific purposes—						
Medical and surgical	.....	626,801	.....	453,233	.....	535,162
Optical	.....	1,725,075	.....	3,252,247	.....	1,896,670
All other	.....	1,299,918	.....	3,638,344	.....	2,617,143
Iron ore, tons	707,641	2,181,629	1,183,952	3,692,496	1,141,048	4,496,309
Pig iron—						
Ferromanganese, tons	.....	.....	.....	.....	5,468	570,370
Ferrosilicon, tons	.....	.....	.....	.....	6,863	704,056
All other, tons	224,509	3,667,167	612,241	15,317,085	265,840	9,771,979
Lead, pigs, bars, etc.—						
Produced from domestic ore, lbs	176,612,208	7,928,518	200,930,639	13,508,203	112,418,310	9,816,376
Produced from foreign ore, lbs	42,468,467	1,695,627	19,305,109	1,078,970	64,514,449	2,803,363
Lime, bbls	.....	.....	230,725	132,769	187,934	168,671
Malt, bush	.....	.....	5,102,729	5,826,164	4,156,597	6,783,485
Matches	.....	.....	.....	541,526	.....	477,588
Meat products—						
Oleo oil, lbs	109,185,783	13,011,789	83,891,672	11,431,632	33,402,858	6,799,482
Beef tallow, lbs	26,568,075	1,902,189	15,338,067	1,573,196	7,505,880	1,196,305
Lard, lbs	451,286,439	48,342,444	426,659,590	56,039,641	373,349,323	75,359,055
Neutral lard, lbs	35,389,918	4,006,840	27,314,774	3,687,236	9,395,404	2,011,403
Lard compounds and other substitutes for lard, lbs	63,899,985	5,519,231	49,821,709	5,930,841	50,300,043	8,582,320
Metal polish	.....	.....	.....	217,315	.....	211,345
Metals and metal compositions, n. e. s.—						
Babbitt metal, lbs	1,061,647	204,394	2,678,455	670,640	2,343,395	668,806
Ferrovanadium, lbs	840,265	741,085	2,031,087	2,035,276	2,430,424	2,914,600
†German silver	.....	.....	.....	337,680	.....	891,746
Tungsten and ferrotungsten, lbs	.....	.....	574,321	1,352,631	2,211,303	3,897,237
†All other	.....	.....	.....	.....	.....	1,255,666
†Mica and manufactures of	.....	.....	.....	78,671	.....	74,485
†Mucilage and paste	.....	.....	.....	386,419	.....	429,746
Naval stores—						
Rosin, bbls	1,383,634	6,597,570	1,842,313	11,325,831	1,491,657	10,339,178
Tar, turpentine and pitch, bbls	67,000	286,521	76,690	366,637	142,834	677,968
Turpentine, spirits of, gals	10,618,575	4,844,252	9,543,633	4,596,475	6,529,408	3,388,727
Nickel, nickel oxide and matte, lbs	26,418,550	10,128,514	33,404,011	12,952,493	21,996,412	8,940,512
Oakum, lbs	.....	.....	1,294,100	118,207	2,043,911	256,149
Oilcake and oilcake meal—						
Corn, lbs	81,137,289	562,889	21,302,208	346,004	5,519,086	115,784
Cottonseed—						
Cake, lbs	1,293,126,593	17,531,319	1,027,345,871	16,556,246	280,013,565	5,477,479
Meal, lbs	165,710,917	2,296,358	204,594,620	3,458,519	125,394,067	2,758,643
Linseed or flaxseed	606,386,285	10,764,834	667,645,566	12,388,607	.....	.....
*Cake, lbs	.....	.....	.....	.....	116,311,774	2,975,533
*Meal, lbs	.....	.....	.....	.....	13,916,126	357,354
All other, lbs	17,771,393	212,215	30,252,835	504,675	12,235,323	245,653
Oils—						
Animal—						
Fish, gals	125,500	54,607	127,218	67,326	119,281	92,355
Lard, gals	351,394	210,118	357,076	299,865	254,767	276,118
All other, gals	636,772	457,137	560,855	457,315	308,538	320,418
Mineral—						
Crude, gals	158,263,069	4,282,827	172,029,903	7,030,923	171,258,309	7,630,368
Refined or manufactured—						
Fuel oil, gals	779,589,047	21,961,176	957,518,417	27,002,087	{597,196,708 / 82,300,889	27,607,363 / 1,781,048
Gas oil, gals						
Illuminating oil, gals	836,958,665	49,988,597	854,403,313	55,845,103	652,710,138	48,548,224
Lubricating oil—						
Paraffine, gals	239,678,725	39,459,641	260,779,127	43,022,468	{6,373,737 / 135,695,628	1,219,072 / 30,312,001
All other, gals						
Naphthas and light products of distillation—						
Gasoline, gals	112,562,929	13,164,159	767,928,262	33,614,957	224,811,186	49,049,580
All other, gals	169,046,152	20,720,888	188,288,863	35,055,589	191,437,877	44,117,112
Residuum, gals	12,627,162	364,381	6,543,324	161,436	719,536	47,192
Vegetable, fixed or expressed—						
Corn, lbs	16,870,147	1,308,230	9,118,812	911,865	4,709,106	700,149
Cottonseed, lbs	352,439,401	25,233,350	188,213,816	19,390,435	124,816,577	17,300,066
Linseed or flaxseed, gals	1,339,294	736,906	824,052	608,328	1,538,817	1,699,857
All other	.....	1,841,277	.....	2,897,644	.....	3,428,320
Volatile or essential—						
Peppermint, lbs	189,008	384,966	145,278	310,459	72,841	190,841
All other	.....	601,819	.....	939,088	.....	1,068,797
Paints, colors and varnishes—						
Dry colors—						
Carbon, bone and lampblack	.....	392,997	.....	784,332	.....	1,149,069
All other	.....	1,448,310	.....	1,605,737	.....	2,018,996
Lead—						
Red, lbs	.....	.....	.....	.....	2,171,482	267,238
White, lbs	25,310,369	1,409,622	27,435,054	2,137,072	19,738,669	2,089,717
Ready-mixed paints, gals	925,527	1,141,375	1,081,306	1,470,203	1,420,290	2,133,037
Varnish, gals	810,818	735,272	823,179	911,202	911,658	1,303,955
Zinc, oxide of, lbs	39,978,569	2,068,428	27,923,712	2,394,739	30,925,120	3,177,173
All other	.....	2,156,402	.....	4,177,433	.....	4,792,398
Paraffin—					{41,528,156	2,044,726
Unrefined, lbs	386,914,211	12,535,430	376,892,904	14,820,440	{92,776,900	7,045,087
Refined, lbs						
Perfumeries, cosmetics and all toilet preparations	.....	2,182,086	.....	3,526,195	.....	3,847,150
Plaster, builders' and common	.....	213,416	.....	129,872	.....	159,865
Platinum, unmanufactured, ozs., troy	.....	.....	1,145	97,988	3,445	234,433
Plumbago or graphite, unmanufactured, lbs	1,057,764	52,583	1,597,550	98,488	5,151,639	349,617
Quicksilver, lbs	252,852	225,509	666,027	670,475	842,186	998,470
Roofing, felt and similar materials	.....	1,052,896	.....	2,071,979	.....	4,390,577
Salt, lbs	160,948,077	613,847	168,129,201	567,441	228,138,622	1,011,573
Seed—						
Cotton, lbs	2,063,096	38,933	1,530,799	28,371	870,282	30,476
Flaxseed or linseed, bush	5,069	11,334	1,640	4,804	5,199	24,823
Soap—						
Toilet or fancy	.....	2,331,554	.....	2,455,727	.....	1,921,860
All other, lbs	74,836,400	3,579,488	69,797,549	3,660,354	72,462,495	5,004,387
Spices	.....	.....	.....	266,833	.....	449,717
Sponges, lbs	149,152	137,239	193,799	177,550	114,303	138,767
Starch—					{24,862,630	1,422,974
Cornstarch, except for table use, lbs	178,806,224	5,030,542	202,220,751	5,295,145	{22,861,194	1,508,316
All other, lbs			1,411,174	167,539	1,261,504	202,799
Stearin, vegetable, lbs	.....	.....	.....	2,964,584	.....	6,019,803
Surgical appliances not including instruments	.....	4,059,755	.....	395,206	412,445	232,401
Tin, pigs and oxide of, lbs	.....	.....	812,538	794,876	.....	1,022,175
Vulcanized fiber and mfrs. of	.....	459,314	.....	255,643	265,422	95,751
Wax, Beeswax, lbs	.....	.....	85,380			
Zinc—						
Ore, tons	743	35,276	70	3,992	1,179	63,043
Dross, lbs	8,333,513	506,956	965,575	10,801	26,610,262	2,286,122
Spelter, cast in pigs, slabs, etc.—						
Produced from domestic ore, lbs	83,703,889	13,806,824	297,773,217	46,223,347	276,784,653	52,945,891
Produced from foreign ore, lbs	14,142,981	2,019,158	86,457,195	8,080,038	127,777,499	12,715,580

* Not stated separately prior to 1917.
†Not stated separately prior to 1916.

Rosin.

	Barrels.	Dollars.
1913	2,806,046	17,359,145
1914	2,417,950	11,217,316
1915	1,372,316	6,220,321
1916	1,571,279	8,874,318
1917	1,634,430	10,731,972

Salt.

	Pounds.	Dollars.
1913	128,035,915	441,673
1914	148,931,265	542,783
1915	165,619,386	616,132
1916	.....	768,977
1917	.....	852,251

Seaweed.

		Dollars.
1917	.....	26,087

Not stated prior to 1917.

Seed, Cotton.

	Pounds.	Dollars.
1913	24,048,647	328,088
1914	16,342,384	215,115
1915	6,314,439	96,237
1916	2,475,907	37,811
1917	1,001,369	35,434
1916	.....	2,610,481
1916	165,627,801	600,648
1917	194,109,856	726,461

Seed, Flax.

	Bushels.	Dollars.
1913	16,894	26,699
1914	305,546	436,874
1915	4,145	9,748
1916	2,614	6,501
1917	1,020	3,684

Soap, Toilet or Fancy.

		Dollars.
1913	.....	2,132,653
1914	.....	2,141,633
1915	.....	1,777,342
1917	.....	2,122,624

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Soap, Except Toilet or Fancy.

	Pounds.	Dollars.
1913	51,292,554	2,496,904
1914	58,547,763	2,797,369
1915	63,367,750	3,080,957
1916	75,548,686	3,709,277
1917	73,049,219	4,169,117

Soda, Salts and Preparations of.

		Dollars.
1915	.....	3,141,023
1916	.....	12,649,554
1917	.....	18,381,450

Spermaceti.

	Pounds.	Dollars.
1913	216,629	44,744
1914	65,414	13,505
1915	107,385	21,523
1916	72,562	11,387
1917	47,780	10,357

Spices.

		Dollars.
1913	.....	92,963
1914	.....	84,427
1915	.....	76,297
1916	.....	250,827
1917	.....	287,484

Sponges.

	Pounds.	Dollars.
1913	205,804	177,059
1914	209,470	173,866
1915	117,618	109,635
1916	197,826	165,884
1917	135,223	136,632

Starch.

	Pounds.	Dollars.
1913	110,987,591	2,609,716
1914	76,713,779	1,825,230
1915	107,036,638	2,939,453
1916	210,185,192	5,576,914
1917	146,424,342	4,721,567

Stearin, Vegetable.

	Pounds.	Dollars.
1917	1,321,773	179,092

Not stated prior to 1917.

Sulphur or Brimstone, Crude.

	Tons.	Dollars.
1913	73,861	1,353,310
1914	110,022	2,018,724
1915	48,391	885,756
1916	68,460	1,314,290
1917	177,548	3,567,512

Surgical Appliances (Not Including Instruments).

		Dollars.
1913	.....	973,733
1914	.....	1,228,467
1915	.....	4,418,308
1916	.....	3,166,718
1917	.....	2,998,809

Tallow. (This Is Beef Tallow.)

	Pounds.	Dollars.
1913	30,586,300	1,910,439
1914	15,812,831	1,002,011
1915	20,239,988	1,386,445
1916	16,288,743	1,326,472
1917	15,256,844	1,805,743

Tar, Turpentine and Pitch.

	Barrels.	Dlars.
1913	62,346	317,491
1914	351,352	568,891
1915	239,661	430,612
1916	67,963	291,731
1917	103,655	566,896

Tin, Pigs and Oxide.

	Pounds.	Dollars.
1917	798,288	427,709

Not stated prior to 1917.

Turpentine, Spirits of.

	Gallons.	Dollars.
1913	21,039,597	8,794,656
1914	18,900,704	8,095,958
1915	9,464,120	4,476,306
1916	9,310,268	4,337,563
1917	8,833,972	4,308,443

Varnish.

	Gallons.	Dollars.
1913	1,279,777	1,267,860
1914	1,069,501	1,038,864
1915	731,604	682,352
1916	846,362	836,339
1917	891,812	1,104,698

Washing Powder and Fluid.

	Pounds.	Dollars.
1913	9,923,700	456,702
1914	12,761,968	535,628
1915	14,695,317	635,476
1916	7,875,317	355,926
1917	3,517,441	197,614

Whalebone.

	Pounds.	Dollars.
1913	106,174	182,938
1914	35,034	58,165
1915	28,111	32,643
1916	44,934	83,400
1917	40,717	53,717

Zinc Dross.

	Pounds.	Dollars.
1913	102,569	3,271
1914	572,477	29,084
1915	10,361,840	557,247
1916	2,526,288	164,449
1917	11,591,919	983,296

Zinc Ore.

	Tons.	Dollars.
1913	17,308	687,680
1914	14,294	559,785
1915	3,345	138,071
1916	168	12,277
1917	72	2,872

Zinc, Oxide of.

	Pounds.	Dollars.
1912	32,792,882	1,182,683
1913	31,045,147	1,164,589
1914	29,197,790	1,215,360
1915	37,580,411	1,808,970
1916	31,222,228	1,960,589
1917	31,488,061	3,100,694

SPLENDID OPPORTUNITY FOR DRUG AND CHEMICAL EXPORTS FROM U. S. TO SPAIN

High Prices Prevailing for Acetic Acid, Bichromates, Borax, Carbolic Acid, Caustic Soda, Citric Acid, Glycerine, Soda Ash, Blue Vitriol and Pharmaceutical Supplies.

A chance has arisen because of the war for American manufacturers of pharmaceutical products to enter the Malaga market. Apparently there is a very firm demand for drugs to supplement the insufficient production in Malaga. Two important manufacturing nations—Austria-Hungary and Germany—are shut off from this market. Facilities for other European nations to make the goods are seriously impaired by lack of workmen and raw materials. Accordingly this is an opportunity for American drugs and chemicals to gain a permanent foothold here.

Custom-house statistics show that 40,263 metric tons of drugs, chemicals, and medicines, valued at $3,891,201, were imported into Spain in 1915. Fertilizers and insecticides, including sulphate of copper, are omitted from these figures (metric ton=2,204.6 pounds).

Acetic Acid.

Acetic acid is used for industrial purposes and especialy for making vinegar. The annual consumption of this product in Malaga would not exceed 50 metric tons. Acetic acid comes packed in 25-liter jemijohns. The present retail price of acetic acid is about 4 pesetas per liter, as against the ante bellum price of 0.90 peseta per liter (liter=0.26 gallon; peseta at present exchange=$0.23).

According to section No. 210 of the Spanish customs tariff, the rate of duty on acetic acid imported into the kingdom is 0.50 peseta per kilo, gross weight. The general and minimum rates of duty are identical. Acetic acid falls under the same classification as pyroligneous acid. According to the 1915 customs statistics, 2,865 kilos of these acids valued at 4,584 pesetas, were imported into Spain in that year.

Bichromates.

The principal uses of bichromates or potassium bichromate ore for dyeing and soap making. It is estimated that the annual consumption is probably not much over 10 tons. Bichromates are not manufactured in Malaga, and it could not be established that this article is produced in Spain. It is usually imported in barrels of 100 and 200 kilos. The rate of duty on bichromates is 15 pesetas per 100 kilos, gross weight. The general and minimum tariffs are identical. The actual selling price of bichromates is from 7 to 8 pesetas per kilo as against 1 peseta before the war.

Considerable quantities of bleaching powder are used in Malaga. It is estimated that the annual consumption is more than 1,000 metric tons. Its principal uses are for bleaching cloth and paper and for disinfection in general. Before the war, bleaching powder was imported in large quantities from France. The price at that time was about 14 francs per 100 kilos, c. i. f. Malaga. At present the price is from 65 to 70 pesetas per 100 kilos.

The import duty is 3 pesetas per 100 kilos, gross. The general and minimum tariffs are identical. From customs statistics it appears that 2,574 metric tons of these chemicals, valued at 720,824 pesetas, were imported into Spain in 1915.

Imported Borax.

Borax is used extensively in the clothing establishments and laundries. Estimates place the consumption in Malaga at approximately 30 metric tons. So far as it has been possible to ascertain, borax is not mined there. It is imported in both crystals and powder, in barrels of 100 kilos and more. Before the war the ruling prices were from 50 to 65 pesetas per 100 kilos. Today it sells for 150 pesets per 100 kilos.

According to paragraph 223 of the Spanish customs tariff, the regular and minimum rate of duty on borax is 3 pesetas per 100 kilos, gross. In the customs statistics borax is included with carbonates, borates and alkaline silicates and ammonia salts, with the exception of sulphates. Of these chemicals, 2,074 metric tons were imported during 1915, with a value of 456,463 pesetas.

Carbolic acid is used only in limited quantities, principally in pharmacies and for disinfection. So far as it has been possible to ascertain, it is not made in Spain. The annual consumption in Malaga is said not to be much in excess of 2 metric tons. This acid is imported in galvanized iron cans of 25 and 100 kilos, and in blue-glass bottles of 1 kilo. There has been an increase in the selling price of carbolic acid from 2 pesetas per kilo before the war to 14 to 20 pesetas now.

The minimum rate of duty on this product, which is applicable to imports from the United States and the principal manufacturing nations of the world, is 0.40 peseta per kilo, net weight. The regular tariff is 0.60 peseta per kilo, net. Carbolic acid is grouped in the statistics with naphthalene, creolin and other similar antiseptics. The total imports in 1915 were 53 metric tons, valued at 57,908 pesetas.

Caustic soda is manufactured in Torre la Vega and Barcelona, Spain. Its principal use is in making soaps. Considerable quantities are consumed in Malaga. This product, of 70 to 72 degrees, and 60 to 62 degrees, is packed in iron drums of 50, 100 and more kilos. The brand registering from 50 to 52 degrees comes in wooden barrels of 300 kilos. The actual selling price of the last-mentioned variety is 52 pesetas per 100 kilos.

Caustic Soda.

According to paragraph 240 of the Spanish customs tariff, imports of caustic soda are dutiable at 4.50 pesetas per 100 kilos, gross. The regular and conventional rates are identical. The customs statistics group caustic soda and potash together. Spain's imports of these chemicals in 1915 were 53 metric tons, valued at 17,698 pesetas. The exports of caustic soda were 2,529 metric tons, most of which went to Portugal.

Chlorate of potash, which is now made in Spain, is used in pharmacies and for pyrotechnic purposes. The annual consumption in Malaga is said not to exceed 10 tons. The crystals usually come packed in barrels of 100 kilos. Before the war the selling price was 120 pesetas per 100 kilos. This has now advanced to 700 pesetas per 100 kilos. The rate of import duty is 0.25 peseta per kilo, gross weight. The general and minimum tariffs are identical. In the customs statistics chlorate of potash and soda and phosphoric acid are all grouped together. The total imports of these articles in 1915 were 63 metric tons, valued at 58,913 pesetas.

Citric Acid and Glycerine.

Small quantities of citric acid are made in Spain. Citrate of lime is produced at Pizarra near Malaga, and it is said that a citric-acid factory is to be erected at Malaga in the near future. This product is used principally in pharmacies and to a certain extent industrially. It comes packed in boxes of 50 and 100 kilos, lined with white cloth. The ante bellum price was 7 pesetas per kilo, and the present price is 12 pesetas per kilo.

According to the customs tariff, the general and minimum rate of duty is 0.45 peseta per kilo, net. For tariff purposes citric acid is grouped with tartaric acid, alkaline and earthy citrates, and tartrates. The annual consumption in Malaga is 28 degrees, which was sold before the war at 2.80 pesetas per kilo, is now at 6 pesetas. Glycerine of 31 degrees, which was at 3 pesetas per kilo, is at 6.30 gross. The imports of glycerine into Spain during 1915 were 3,426 kilos, valued amounted to 367 metric tons, valued at 1,192,786 pesetas.

The general and minimum customs rate on glycerine is 22 pesetas per 100 kilos, estimated at 20 metric tons. Glycerine glycerine factories at Barcelona, San Sebastian, and Santander. Glycerine of and also in glass bottles. There are at 5,584 pesetas. Spain's exports of glycerine, in bottles, is now at 8 pesetas.

used both industrially and in pharmacies.

Glycerine, which is made in Spain, is In 1915 the imports of these substances comes packed in cans of 10 and 20 kilos pesetas, and the superior English glycerine in 1915 amounted to 935,739 kilos, valued at 1,522,887 pesetas.

Soda Ash and Blue Vitriol.

Soda ash, both in powder and crystals, is used for cleaning purposes, lithographic work, glass making, paper and soap manufacturing, etc. The annual consumption in Malaga is estimated at 1,000 tons of crystallized and 3,000 tons of the dry. The crystallized comes packed in barrels of 300 kilos and the dried in double stacks of 100 kilos. Since the outbreak of the war the price of this product has increased from 18 to 24 pesetas per 100 kilos. The minimum and general rate of the import duty is 3 pesetas per 100 kilos, gross. The import statistics of soda ash are included in the figures for borax.

Blue vitriol is extensively used, especially in the vineyards. Considerable quantities are made in Spain. As early as 1904 more than 6,000 tons were made in the Province of Huelva alone. It is imported in wooden barrels of 250 kilos.

The import duty is 0.50 peseta per 100 kilos, gross. The market price before the war was 60 pesetas per 100 kilos, but has risen to 130 pesetas. In the customs statistics blue vitriol is classed with insecticides to combat plant and animal disease. The total imports under this section for 1915 were 6,667 tons, valued at 3,600,195 pesetas.

Patent Medicines.

There is a demand for all sorts of pharmacists' supplies, such as test tubes, funnels, beakers, and various special bottles. To comply with the Spanish sanitary regulations medicinal preparations of all kinds must have the formula on the containers and labels and must be listed in the Spanish Pharmacopœia before they can be placed on sale.

The fertilizer factories in Malaga manufacture sulphuric acid of 53 degrees, the market price of which is 13 pesetas per 100 kilos; sulphuric acid of 60 degrees, at 18 pesetas; and of 66 degrees at 23 pesetas.

A golden opportunity seems to be presented for American manufacturers to establish themselves thoroughly in this market. The success or failure of their efforts will depend almost entirely upon their ability to place their goods here at as low a price as their competitors. Manufacturers of drugs, chemicals, and pharmaceutical supplies should carefully study the trans-Atlantic freight situation. The freight rates should be carefully investigated, and if American products can be offered in this market on equal terms with their competitors, it would seem advantageous to send over an enterprising representative to study the needs of the market and make proper connections. Small medicines are imported by parcel post.

Imports for Individual Needs.

There are no jobbers in the American sense of the term in this district, as all the pharmacies import for their individual needs. In the selling of general drugs, it would not seem necessary or even advisable to seek an exclusive agent. It is important that attention should be paid to quoting prices and weights in Spanish currency and the metric system, respectively.

Credit terms, in practice, vary from cash against shipping documents to 60 and 90 days with 2 per cent. discount for cash.

HOW URUGUAYAN INSTITUTE INAUGURATED MANUFACTURE OF CHEMICALS AT MONTEVIDEO

Scope of Output Increased Rapidly Since 1915—Commodities Now Produced Commercially.

In 1913, at the recommendation of Dr. Latham Clarke, an American specialist in charge of the National Institute of Industrial Chemistry at Montevideo, the first steps were taken toward the creation of a factory of chemical products to be operated in connection with the institute, reports Consul William Dawson, at Montevideo. A certain amount of apparatus was purchased in the United States, but before the factory could be inaugurated the war broke out, and for financial reasons the work was postponed. About the middle of 1915, when the scarcity of chemicals began to be felt, an appropriation of about $2,000 was obtained, and the manufacture of chemicals on a commercial scale was commenced. Since then the scope of the factory has increased steadily.

The following products are made and sold: Absolute alcohol, pure rectified alcohol, ammonia, distilled water, nitrocellulose, benzol, nitrobenzol, pure bicarbonate of soda, pure carbonate of soda, barium chloride, pure chloride of soda, elastic, office and photographic collodion, creolin, sulphuric and anaesthetic ether, petroleum ether, naphthalene, pure nitrate of potassium, crystallized silver nitrate, artificial Carisbad salts, salicylate of soda, pure barium sulphate, anhydrous and crystallized sodium sulphate, pure iron sulphate (ammoniacal or commercial), sulphate of lime, toluol, and xilol. Chloroform, benzonaphthol, benzoate of soda, hexamethylenetetramin, iodoform, salicylic acetil acid, etc., have been prepared, but their manufacture has had to be suspended on account of lack of raw materials. Successful experiments have been made in the manufacture of glycerin, hydrogen peroxide, bitartrate of potassium, tartaric and acetic acids, methyl alcohol, and acetone. Lack of space and funds to purchase apparatus have prevented the manufacture of these products on a commercial scale.

Experiments have been conducted for some time in the dry distillation of bituminous shale found in the Department of Cerro Largo, from which an oil yielding 9,500 calories has been obtained.

Ether Finds Good Market.

Ether made in the factory has been widely used, and the capacity of the plant has recently been sufficiently increased to permit it to meet the entire home demand for this article. Another product of the factory for which there is a good demand is sulphide of lime, used for sheep dip.

The proceeds of sales have been sufficient to cover all expenses of the plant, including increase in equipment. Much of the apparatus has been made in the factory's own shop, which recently turned out three rectifying columns used in purifying toluol, benzol, absolute alcohol, and anesthetic ether. The apparatus used in making sulphuric ether, sulphide of lime, chloroform, creolin, naphthalene, distilled water, etc., was also constructed locally.

Sales made up to date total approximately 40,000 pesos ($41,360), and the factory has some 350 customers on its books, including hospitals, sanatoria, wholesale and retail druggists, and industrial establishments. The staff consists of one foreman, one mechanic, one fireman, one carpenter, eight laborers, a bookkeeper and sales manager, a salesman and collector, a clerk, and a delivery man. The administrative and scientific management is in the hands of the director of the National Institute of Industrial Chemistry.

Permanent Competition Not Contemplated.

It is not the intention of the institute to become a permanent competitor of local or foreign manufacturers of chemicals. The director has recently drawn up a plan of organization which would provide for the following activities:—

General laboratories for investigation of native products, official analyses, assays, industrial consultations, standards, etc. Courses of instruction in industrial and applied chemistry. Experimental manufacturing laboratories which would give students practical work and at the same time make it possible to experiment with a view to determine the feasibility of making different products in the counry. Experiments would be made with various classes of machines, and the laboratories would be able to supply manufacturers with information as to equipment, sources of supply, costs, working results, methods, etc. It would also be possible to train a limited number of factory hands in the use of apparatus. It is not intended to convert these laboratories into regular factories of chemical products, although they might render useful service in times like the present, when regular sources of supply are cut off. In general, however, their object would be experimental.

DU PONT AMERICAN INDUSTRIES

DU PONT

ESTABLISHED 1802

Du Pont American Industries

This organization of industries exemplifies a new epoch in world commerce—the era of amalgamation of related industries as contrasted with the prior era of concentration on the development of a single industry.

Popular sentiment and law opposes the trust idea—the control by one concern of a majority of the nation's industries in one line—but industrial progress demands and welcomes the idea of using the experience, capital, organization and facilities of a successful business to develop other industries that are related to it either in manufacturing or selling problems.

Du Pont American Industries are American in origin, financing, management and operation. No allegiance is paid to foreign capital or control. They are crystallized around an aggressively progressive manufacturing institution showing an unbroken record of 116 years of constant development along practical lines of industrial manufacture, purchase, finance and sales; and which has through all of its history been a loyal supporter of American affairs and of the Government of the United States. The fair attitude of the Company toward all lines of allied business and toward the buying public has permitted it to establish its trade-mark, the Du Pont oval, as a positive guarantee of quality and service, which guarantee is now extended to all of its lines of endeavor.

The permanency of this guarantee is assured through the ample financing of all interests; through the ability and efficiency of engineering and operating departments; through a purchasing department that searches the world for the best raw materials; and through a sales department that makes detailed studies of domestic and export needs, and of the most economical methods of filling wants.

The different Du Pont industries are all, in a way, separate and distinct, but have as common bonds the intimate interlinking of the various highly specialized chemical units, and administrative control. No separate unit is primarily dependent upon the others, and the various materials manufactured by any one unit are in no way by-products of other units, but are in all general classes, specifically manufactured for the purposes for which they are sold.

The following major items will show briefly the intimate relation of all units of Du Pont American Industries, and the capacity, through properly co-ordinated plants, to take an active part in meeting foreign competition in times of peace, by furnishing the world with standardized American products of proven worth:

EXPLOSIVES Chemistry enters most intimately into the manufacture of all classes of explosives, from the ordinary black powder of historic fame and modern use, through the dynamites, permissible explosives, sporting and military powders, to the most delicate of fulminating detonators. Acids, nitrates, stabilizers, absorbents, nitrated cotton and bases are required. Industrial explosives of the classes enumerated are absolute essentials to mining and to the iron and steel industries, on which all industrial and much agricultural development depends.

FABRIKOID The nitration of cellulose, which is the base of the manufacture of modern explosives, is at the same time, when properly compounded with various colors and dissolved in much the same class of solvents, the main coating for leather substitutes, the demand for which is rapidly increasing.

PYRALIN A similar connection exists between Pyralin and the other products mentioned. Here, too, the nitration of cellulose is the principle on which the business is built.

PYROXYLIN LACQUERS, Etc. Pyroxylin lacquers, enamels, split leathers, leather substitute solutions and a considerable variety of other compounds also find their origin in the nitration of cellulose and in the dissolving of the material formed. In each process similar acids and solvents and similar processes are used as in the cases already mentioned.

PAINTS Another phase of the chemical industry is the manufacture of paints. Here, also we have the use of practically the same chemicals, colors and ingredients as in other Du Pont products. It is in reality a highly specialized branch of the chemical industry.

DYESTUFFS The bases from which most of the military high explosives are derived are obtained as by-products of the coking industry, and from the same source are obtained the bases from which are manufactured the intermediates, and finally the dyes so much needed today to supply practically every other industry. This is the reason why all these industries fit comfortably into the general organization as separate but closely allied units.

This announcement is made by the DYESTUFFS SALES DEPARTMENT for the purpose of fixing in the minds of all, the logic of the development and the strength of the foundation upon which it rests. The construction of our dye plants is progressing satisfactorily and on schedule time; some of the more important ones will shortly come into commission; others will follow.

E. I. du Pont de Nemours & Company

Dyestuffs Sales Department

Wilmington Delaware

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DU PONT

FLAXSEED CAKE AND MEAL MARKETS FOR YEAR 1917.

MINNEAPOLIS SEASON A DISAPPOINTMENT; WEATHER CONDITIONS OFFSET TO ACREAGE

Minneapolis, Jan. 25, 1918.

The 1917 season in the linseed trade was decidedly disappointing. The light reserves from the 1916 crop dragged to market falteringly at the start of the year because of weather conditions that were unusually severe. Heavy snowfall threw the railroad lines out of gear, and high prices had to be paid for the limited arrivals at terminals. In a way, these conditions were favorable, for they laid the foundation for a larger acreage during the season of 1917, but for the greater part of January and February the crushers were bothered in their operations by the heavy snowfall that interfered with switching to and from mills. Elevator stocks of seed were very moderate at Minneapolis at the turn of the year, and had the crushers enjoyed the usual volume of oil trade they would have proved insufficient to insure a steady run, but lack of opportunity to ship oil freely on contracts on books and a light current trade all served to keep the seed requirements at a low level.

Manchurian Seed Received.

During the early part of the year, the small run of domestic seed and estimates of farm reserves as based on the government estimate of the crop caused some worry to the crushers regarding their ability to secure ample supplies to run through the summer, though it was not long before foreign seed began to come to this country in volume, attracted by the high prices prevailing in our markets. For the first time in the history of the Minneapolis market Manchurian seed was received. Imports of Manchurian seed for use in Oregon mills had been made before, but none of the supply had penetrated as far as Minneapolis or the East. On arrival here the seed proved to be of poor quality and was thought to have originated in Japan, so local crushers would not pay the prices asked, and as the freight rate to markets further east were the same, buyers in other sections were the successful bidders for the lot, which consisted of 10 cars.

In spite of the high prices being paid on this side of the boundary, Canadian seed was slow in starting to markets here. As it later developed, the lack of movement was not due so much to the fact that our prices were unattractive as to the fact that there was a dearth of rolling stock to make deliveries. There was considerable seed needed in France and the United Kingdom for war purposes, but this demand was not sufficient to take care of the offerings from India, Argentina and Canada, so considerable of the Canadian reserve, which was light, came to our markets at a time when supplies were badly needed. These Canadian imports were quite extensive during the course of the season, though cheaper offerings of Argentine seed had a tendency to check the movement for a time.

Crop Season Bad Failure.

The crop season was a dismal failure, owing to climatic conditions. The spring season was fairly early and rather erratic, but there was plenty of moisture in the ground to start germination because of the excessive snowfall of the winter, the heaviest in forty years. Because snow came early in the fall, frost did not penetrate the ground to the usual depth, and a great part of this moisture was absorbed and did not run off as freely as expected. Early sown seed received a good start and made rapid growth for a short time. Along in May dry weather with frost developed and caused considerable damage. Farmers were able to re-seed their land in plenty of time, but continued dry weather over the best flax producing section held back germination and all late sown seed was affected. At the end of June the season was about two weeks behind and the farmers began to worry over the possibilities of the usual August frost nipping their flax.

The acreage planted was considerably larger than was anticipated, owing to the unusual spring season. Considering the propaganda in favor of sowing a large wheat acreage to meet war needs the amount of flax sowing was surprising, and for a time it looked as though farmers in this country would raise about all of the seed needed for domestic purposes, but as the summer advanced the trade was doomed to a sore disappointment. Week after week went by and the weather refused to warm up. Late sown seed in many sections failed to receive needed moisture, while in other sections a combination of excess rain and coolness caused seed to rot in the fields. The latter case was more the exception than the rule, but on the average the climatic conditions were harsh and unfavorable.

North Dakota Hit by Drought.

Owing to the stimulus offered by war conditions and the entry of the United States into the hostilities, there was a lot of prairie land broken in Western North Dakota. This land is generally regarded as best adapted to raising flax, and the farmers put the best part of it to the purpose of cultivating that grain. A greater part of this acreage was in a belt that remained dry most of the season. Rains skirted it on either flank and fell in Canada but persistently failed to fall where it was needed to do the flax crop the most good. Crushers were quite jubilant over the increase in acreage in this territory, because the best seed is produced there. Visions of a 15,000,000 bushel crop brought a smile of satisfaction to the faces of most of the crushers, but conditions gradually went from bad to worse, and estimates of the possible yield began to shrink sharply. As the prospects dimmed, prices began to advance by leaps and bounds and finally the Duluth Board of Trade officials became alarmed over the situation and put a maximum price of $3.30 on all futures, which practically made them useless as a hedging medium. The position of the directors was poorly taken, according to the ideas of the crushers and producers, but they stubbornly held their ground for a time. A large part of the hedging business was done in the Winnipeg market, while the maximum was in effect in Duluth, and the former market felt the effect of crusher buying and that of speculators. Finally, the maximum in Duluth was removed and the market rallied sharply, only to fall back noticeably from the extreme top.

The crop did not turn out as badly as the ultra pessimistic reports indicated, but a considerable portion of the acreage showed such poor returns that the farmers refused to pay high labor prices to thresh it, and this threatened to cut down the marketable surplus to a serious extent. After the maximum was removed, the market moved high enough to encourage the harvesting of fields that did not promise better than 3 to 4 bushels to the acre.

Collapse in Montana.

The sharpest disappointment of the year in the producing situation was the collapse in Montana. Very fine seed is raised in that State when weather conditions are anywhere near favorable, but in the season of 1917 they proved to be anything but favorable, and in spite of a largely increased acreage the outturn for the State was very light.

The situation in more southerly territory was quite favorable on the whole, and a fair average crop was raised in Southern Minnesota and South Dakota. The quality of this seed was no better than usual. The seed was perhaps a little brighter, though the oil content was even smaller than usual.

As a fitting climax to the season, severe frosts developed earlier in August than usual. They struck hardest where the drouth had sapped the life of the plants, and much damage was done in North Dakota. Rains revived part of the Montana flax just before harvest time, and, although some of the fields that were given up as lost came back wonderfully, there was no important production, and only a small amount of Montana seed was received during the year.

Early in October deep snow came to North Dakota and buried a lot of flax in the field and it looked as though a further important loss would be experienced, but the weather turned off favorable afterward and for a long time dry and warm weather gave the farmers an opportunity to thresh this stuff.

Argentine Reports.

The eyes of the trade have been directed towards Argentina for the past several months, and the promise of the crop there has been a partial offset to the disappointment in the domestic situation. Even though the demand for linseed oil showed an unexpected shrinkage, the trade was worried over the lack of seed to carry them through until another harvest season rolled around, and it was only the favorable developments in the South American country that prevented a runaway flax market.

As it was there was a panicky upturn on reports of frost damage in Argentina. Previous to that upturn the market was constantly sagging under the pressure of offerings from that country. Buenos Aires traders offered new crop supplies persistently and at gradually lowering prices. These prices were sharply below the domestic level and large quantities were purchased for January and February shipment. The fact that delivery had to be made in slow going sailing ships helped to keep domestic prices at a fairly high level, as there was strong competition between Eastern and Western crushers for supplies of seed to take care of immediate needs. There was sharp bidding for delivery at Duluth before the close of navigation and premiums over the November and December future finally got so strong that Western crushers stepped aside and let the Eastern crushers have the bulk of the stuff moving to market, expecting that there would be a sharp reaction just as soon as navigation closed.

Navigation did not close as early as expected and before it did close quite a supply of the limited Northwest reserve got away from Minneapolis crushers.

The movement of seed was very light and straggling from the beginning of the new crop season, and there was no chance to accumulate any reserve of importance at either Minneapolis or Duluth, and deliveries on futures were below normal. Compared with previous season figures the marketing showed very small volume, yet the country reports indicate most of the farm reserve gone. The car situation has been bad for months and country shippers have given wheat and other bread making grains preference in making shipments to terminals. There is considerable seed in interior elevators, but if the government estimate aof the crop was nearly correct there is no supply of importance to come to market during the balance of the crop season. At the end of the year Minneapolis public elevators held but a few days' supply of seed in their bins and there was practically no seed in private bins.

Canada Disappointing.

As was the case a year ago, the Canadian movement was disappointing as far as the new crop was concerned. Considerable frost damage was done in Canada as well as in this country, and a small yield resulted. For a long time it was supposed that the Canadian seed was being held back for the use of the Allies, but at this writing a considerable portion of 300,000 bushels held in Canadian terminal elevators has been purchased to come to Minneapolis and Duluth. Just prior to the closing of lake navigation, a lot of Canadian seed was shipped to Eastern crushers and helped out there, but not sufficiently to prevent the Eastern crushers from reaching out for a large part of the remaining surplus of the Northwestern supply. No great hopes are builded on Canada as a supply factor, and the trade is waiting for the cargoes of Argentine seed now on the way in sailing ships.

With two very disappointing seasons behind them and a big Argentine crop seeking an outlet to this country, the 1918 season is very unpropitious. Farmers are paying some heed to the call of the government to raise four grains, and with wheat prices fixed at a level that insure a good financial return on their acreage it is very doubtful whether producers will take another venture in flax. All grains are at a level that assure good returns and flax seems to be about the most unreliable of the repertory of grains and in bad favor with Northwestern agriculturists. Many farmers will sow a small acreage to feed their animals, but few will make a serious business of raising flax in 1918.

Linseed Oil.

Conditions surrounding the linseed oil trade during the year 1917 were somewhat peculiar, but withal quite satisfactory. The year opened with a better demand than usual, and buyers, having made few contracts during the previous fall, when most of their buying for the year is done, were compelled to come into the market often for supplies they failed to engage earlier. Unused to the high prices that prevailed late in 1916, the majority in the trade kept deferring their heavy purchases for a more favorable time, but this long looked for "favorable time" never seemed to arrive. As a result trade was steady in character through the first three months of the year at least.

From the start of the new year crushers were somewhat uneasy over the cash flax supply and for this reason they were not inclined to take any foolish risks in securing business. For a time it looked as though domestic seed supplies would have to take care of the requirements of the trade through the season as it was supposed that the Canadian supply would go to England and France on account of the disappointing outturn of the Argentine crop. With these facts in mind, most of the crushers sailed close to the wind and were careful not to make commitments that they felt they might not be able to fulfill. In almost all cases they failed to scramble as heedlessly for orders as they were accustomed to do, and a full carrying charge was demanded on deferred contracts. With the price of raw material so high this carrying charge was more than usually heavy. As deferred futures of flax did not represent a carrying charge in the matter of cash flax more than the usual care was necessary in the matter of accepting trades. As most of the trades had to be covered with cash flax as soon as it could be obtained it was only natural that the sellers should do business cautiously.

Some time after the turn of the year many of the buyers became weaned from the idea that low cash flax prices would prevail during the season, and they began to make deals covering supplies for the time intervening up to the beginning of the new crop movement. In view of the outlook for limited supplies, this sort of business was not encouraged by the crushers and when prices began to soften it was not very hard to discourage the buyers from attempting to make forward commitments of importance. Then, too, business did not come up to anywhere near the expected volume in many lines on account of financial conditions and the participation of the United States in the war. As soon as relations with Germany were severed business slowed down perceptibly, and lack of new construction work caused a shrinkage of 25 per cent. and more in the demand for paint and linseed oil. The trade hoped that this would prove to be but a temporary setback, but business never seemed to improve as far as constructive work was concerned. At the end of the year the situation was as quiet or more quiet than at the beginning.

Volume Fairly Satisfactory.

However, the steady buying for prompt and nearby shipment made a fairly satisfactory year for the crushers in the matter of volume. Government orders replaced part of the business lost through the slackening of construction work and soap makers bought more freely of linseed oil because of the shortage of other base material. Government business was not heavy and orders from munitions manufacturers did not come up to the totals expected.

While there never was a large supply of linseed oil on hand during any time of the year, the crushers were careful to keep enoufh manufactured to complete contracts on their books. Shipping directions were generally prompt right through the season though deliveries were slow for several months on account of the lack of cars. Tank cars, usually plentiful in bigger years than that of 1917, were scarce on account of the slow movement of freight in general. Trips that usually consumed weeks took months, and that approximated the removal of just so much tank tonnage from circulation. Box cars for the shipment of coopered lots of oil were about as hard to obtain as tank cars, and buyers were badly served for many months, though it was due in no instance to dereliction on the part of crushers. The use of cattle cars was resorted to to help out matters, but when the oil was shipped to warmer territory the manure in them softened and made barrels unfit to handle. At the end of the crop year the supply of oil had dwindled to meager proportions and crushers were compelled to make shipments almost as soon as fresh supplies come from the presses.

Operation Troubles.

Crushers had their share of troubles in operating. Severe storms early in the year made the railroad yards almost impassable, and some plants had to close down or reduce operations for a time, as cars could not be placed for the removal of oil or by-products. As the year drew to a close the comparatively high prices prevailing for domestic seed rather put Western crushers out of the running in oil business, except in local territory, owing to the cheap offerings of Argentine seed for shipment in time to reach this country late in February or early in March. Prices quoted on the basis of this Argentine seed were so attractive to buyers that they laid back as much as possible and business here was practically at a standstill, beginning shortly before the holidays. Stocks of oil and seed were extremely light and in anticipation of a liberal supply of Argentine seed some of the equipment of local mills

Linseed Oil Meal.

Considered as a whole the oil meal market for the past year was very satisfactory. Starting with a good demand, the season throughout was active in tone with the exception of a short period of a month or six weeks. Much of the activity was caused by the shortage of millfeed and the high prices prevailing for same. Drought in Texas and the South diverted millfeed from winter wheat States to that section, and Northwestern flour mills could not very well look after the demand from other sections. The strong call for their offerings resulted in such a high range of values that feeders began to look for other and cheaper feeding material. Oil meal, considering its protein content, was the most satisfactory substitute, and offerings were steadily taken. At the opening of the year the price of meal was around $43 per ton, and, with the exception of a reaction that carried the market down about a dollar, there was a comparatively steady rise to $68 a ton with the demand seemingly never satisfied, no matter how strong the quotations.

The only unfavorable development during the season was the lack of cars to keep the output moving. For a time the mills were compelled to slow down in operating because of the accumulation of meal, which was packed in every conceivable corner to keep it out of the way. Leasing of space in warehouses was resorted to at times, so desperate were the crushers for lack of private room. After the extreme cold weather and heavy snow had disappeared, the out movement increased and for the balance of the year there was little bother, due to the accumulation of supplies on hand.

Along about April 1 there was a surprising revival in the demand and the market began to move upward. Buyers had cancelled a number of contracts because of non-delivery, but at the time the seriousness of the drought in the South was not fully appreciated, and millfeed was yet to show its full strength. As soon as the trade became well acquainted with the general situation pertaining to cattle food, there was a scramble to reinstate cancelled orders and to buy anew. From then on there was no lack of demand and crushers had a wonderful spring trade in meal at unheard of prices. At times there was slackness, but books were well filled with orders, and whenever fresh orders were lacking in volume applications on contracts took care of the supplies coming out. Most of the time the demand was for prompt or nearby shipment, and a large part of the trade was with country buyers direct.

A feature during the early spring was selling of meal to buyers in Ireland. Few instances have been recorded where meal has been exported, but in this case it was not cake that was wanted and meal was shipped as asked for.

Always, heretofore, the feeders of the Northwest have had plenty of millfeed available for their use at comparatively cheap prices and the crushers could not build up an important trade in their by-product for that reason. This year the lack of millfeed gave them the long looked for opportunity to demonstrate to the feeders and farmers the worth of meal, and it looks as if the domestic demand for this by-product would be greater in years to come.

Towards the end of the year the lack of foreign trade in cake caused Eastern crushers to reach out into Western territory for meal business, but even this development did not seem to check local trade appreciably, and as the year went out there was a good demand for local offerings at practically the high prices of the season.

Linseed Oil Cake.

During the first half of the past year cake trade suffered loss in volume, owing to the ocean onnage situation, and although exporters were in the market for supplies off and on, no large movement was possible. There were no boats ready at seaports to take care of consignments, and Eastern railroads placed embargoes against shipments to New York unless the shipper could furnish the name of the boat on which the cake was to be loaded. The outlet to Baltimore continued after the New York outlet was cut off, but the movement in this direction was eventually cut off, too.

Besides making fairly liberal sales for early spring and summer shipment, crushers had inquiries for supplies to be shipped as late as December. Owing to the flax crop news and the good demand prevailing for meal, there was little inclination to sell cake for far deferred shipment, and, as it turned out, there was no use in making deals as no deliveries could be made to Holland or the Scandinavian countries owing to the ac-

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tion of the export board appointed by the government.

Early in the year quite an important accumulation of cake began to show at the seaboard, and although there was an urgent need of supplies in Holland, for some reason or other the Dutch government failed to send boats over to take care of the glut in our ports. Along in June rumors evidently reached Holland that there might be interference with shipments by our government and there was a rush of tonnage to move the cake before developments grew too serious. By the time the boats arrived and had been loaded, the blow fell and exports were not allowed to be made, which was part of the stronger blockade operations against the Central powers. Since that time a number of boats belonging to owners in Holland have been lying idle in our harbors loaded with cake that is badly needed at home, and the owners of the cargoes stubbornly refuse to relinquish possession of them. Recently it was reported that several large lots of cake would be sold out for the owners, but so far nothing seems to have been done about the matter. We need the boats and Holland needs the cake, and both governments are at loggerheads over the situation, while the much wanted tonnage is lying idle.

There was a scattering trade with buyers in the United Kingdom during the last part of the year, but when the year ended the cake market was practically a thing of the past with the best customers of the crushers shut off from our supplies completely. The purchases for use in the United Kingdom were the beginning of an offset to the trade that was lost when the right to export supplies to Holland and the Scandinavian countries was refused by our export board. Of course, the crushers look for a revival of trade immediately that peace treaties are signed, but in view of the large crop of Argentine seed and the feeling aroused when we refused to allow further supplies to Holland, it is probable that a sudden cessation of hostilities would result in Rhine mills striving to furnish the bulk of the meal and cake needs of the Dutch. With the meal demand as strong as it is right now, this would be of slight importance to our crushers, but the need of this foreign outlet would assert itself sometime in the future.

No. 1 Flaxseed Prices.

Monthly range of cash prices, daily closing quotations, for No. 1 flaxseed in the Minneapolis market for the calendar year 1917, with comparisons for the year 1916, follow:—

Month.	1917. High.	1917. Low.	1916. High.	1916. Low.
January	$2.83¼	$2.94¼	$2.15¾	$2.37
February	2.88½	2.78	2.25	2.39
March	2.75¼	3.00	2.15¾	2.35¼
April	2.93	3.39	2.00	2.22½
May	2.97	3.57	1.83½	2.09¼
June	2.81½	3.32	1.73½	1.88½
July	2.64	3.36	1.79	2.12
August	3.30	3.76	2.04	2.28
September	3.21	3.55½	2.00¾	2.32
October	3.01½	3.30½	2.26¼	2.70
November	3.18½	3.43	2.59¾	2.93½
December	3.21	3.57	2.76¼	2.94

Receipts of Flaxseed.

Receipts of flaxseed in the Minneapolis market during the calendar year 1917, with comparisons for the year 1916, follow:—

Month.	1917.	1916.
January	544,260	319,470
February	441,550	398,800
March	441,220	810,160
April	383,840	485,880
May	263,000	440,250
June	565,000	362,860
July	325,000	440,850
August	92,000	199,300
September	265,000	315,590
October	979,600	2,380,410
November	1,112,240	1,693,890
December	613,670	1,044,740
Totals	6,026,380	8,892,200

Shipments of Flaxseed.

Shipments of flaxseed from the Minneapolis market during the calendar year 1917, with comparisons for the year 1916, follow:—

Month.	1917.	1916.
January	57,420	108,700
February	77,540	37,570
March	103,110	27,020
April	49,810	12,120
May	122,160	25,540
June	17,280	6,970
July	76,410	16,060
August	22,470	34,250
September	27,040	10,440
October	76,920	299,100
November	424,420	467,970
December	117,570	117,960
Totals	1,172,150	1,163,700

Stocks in Warehouses.

Stocks of flaxseed in public warehouses in Minneapolis the first of every month during the calendar year 1917, with comparisons for the year 1916, follow:—

Month.	1917.	1916.
January	327,890	238,004
February	512,895	265,003
March	512,425	219,914
April	458,321	148,418
May	239,098	118,209
June	122,541	82,240
July	166,456	50,560
August	100,481	21,797
September	4,641	5,374
October	19,202	7,081
November	101,664	56,672
December	46,784	260,650

Shipments of Linseed Oil.

Shipments of linseed oil during the calendar year 1917, with comparisons for the year 1916, follow:—

Month.	1917.	1916.
January	8,063,531	7,369,632
February	8,131,318	8,244,787
March	10,578,867	13,113,782
April	15,960,133	13,703,600
May	15,777,608	14,533,127
June	15,657,439	12,713,629
July	12,352,425	10,839,939
August	11,402,584	10,656,005
September	10,375,899	8,026,097
October	7,660,719	12,251,558
November	9,139,575	9,575,682
December	8,600,834	6,920,168
Totals	133,900,932	127,948,006

Shipments of Cake and Meal.

Shipments of linseed oil cake and meal from Minneapolis during the calendar year 1917, with comparisons for the year 1916, follow:—

Month.	1917.	1916.
January	22,966,390	16,729,484
February	16,455,597	11,358,997
March	21,025,575	16,945,982
April	25,350,912	17,682,648
May	19,801,523	21,118,968
June	14,703,818	17,330,288
July	12,738,744	14,184,704
August	15,035,018	14,307,691
September	11,140,076	17,466,910
October	14,952,431	21,912,209
November	24,588,855	30,493,645
December	22,375,722	24,941,214
Totals	221,134,661	224,472,740

Receipts at Duluth.

Receipts of domestic flaxseed at Duluth during the calendar year 1917, with comparisons for the year 1916, follow:—

Month.	1917.	1916.
January	248,588	461,658
February	114,066	223,206
March	222,549	39,164
April	156,438	32,090
May	364,425	39,077
June	106,458	74,028
July	129,159	121,137
August	71,661	168,550
September	183,946	33,488
October	271,615	909,383
November	838,407	3,609,606
December	538,529	1,444,954
Totals	3,245,841	7,156,343

Receipts of Bonded Seed.

Receipts of bonded flaxseed during the calendar year 1917, with comparisons for the year 1916, follow:—

Month.	1917.	1916.
January	53,910	2,076
February	55,071	14,327
March	105,375	37,810
April	47,302	27,103
May	151,134	5,565
June	14,840	136,038
July	100,833	1,128
August	4,375	7,184
September	1,846	4,411
October	.....	56,705
November	.....	38,160
December	306,733	103,909
Totals	871,419	434,416

Shipments from Duluth.

Shipments of domestic flaxseed from Duluth during the calendar year 1917, with comparisons for the year 1916, follow:—

Month.	1917.	1916.
January	88,979	28,298
February	15,332	18,202
March	13,441	22,398
April	46,608	12,155
May	1,246,222	428,015
June	878,159	19,674
July	353,549	25,089
August	240,864	755,425
September	150,459	422,958
October	307,482	304,843
November	375,593	2,622,152
December	783,855	2,696,508
Totals	4,500,542	7,355,717

Shipments in Bond.

Shipments of bonded flaxseed from Duluth during the calendar year 1917, with comparisons of the year 1916, follow:—

Month.	1917.	1916.
January	35	.....
February	54	.....
March	1,024	3,122
April	8,099	1,497
May	5,370	10,567
June	4,100	13,324
July	7,309	.....
August	1,024	.....
September	1,102	23,437
October	.....	4,161
November	.....	11,106
December	.....	.....
Totals	28,117	67,214

Receipts at Winnipeg.

Receipts of flaxseed at Winnipeg during the calendar year 1917, with comparisons for the year 1916, follow. These figures are based on the number of cars primarily inspected at Winnipeg. The average per car is rated at 1,100 bushels:—

Month.	1917.	1916.
January	283,800	126,500
February	228,800	188,100
March	368,500	436,700
April	288,200	413,500
May	932,800	684,200
June	751,300	594,000
July	580,800	765,600
August	178,200	712,800
September	61,600	319,000
October	405,900	350,900
November	1,323,300	1,174,800
December	719,400	947,100
Totals	6,122,600	6,713,200

Shipments—Fort William and Port Arthur.

Shipments of flaxseed from Fort William and Port Arthur during the calendar year 1917, with comparisons for the year 1916, follow:—

Month.	1917.	1916.
January	92,826	197,966
February	75,541	35,747
March	105,532	71,651
April	86,346	55,575
May	1,433,523	820,772
June	714,082	364,791
July	687,722	759,244
August	701,451	1,060,454
September	131,704	347,525
October	114,393	733,333
November	881,118	762,186
December	727,787	598,268
Totals	5,752,025	5,827,712

Receipts at Chicago.

Receipts of flaxseed at Chicago during the calendar year 1917, with comparisons for the year 1916, follow:—

Month.	1917.	1916.
January	55,000	36,000
February	43,000	30,000
March	26,000	54,000
April	39,000	38,000
May	290,000	204,000
June	238,000	.....
July	10,000	19,000
August	52,000	57,000
September	.....	188,000
October	114,000	158,000
November	259,000	176,000
December	96,000	.....
Totals	1,222,000	960,000

Shipments from Chicago.

Shipments of flaxseed from Chicago during the calendar year 1917, with comparisons for the year 1916, follow:—

Month.	1917.	1916.
January	9,000	.....
February	2,000	1,000
March	4,000	2,000
April	1,000	1,000
May	.....	8,000
June	1,000	10,000
July	1,000	2,000
August	9,000	.....
September	.....	1,000
October	2,000	.....
November	5,000	1,000
December	8,000	.....
Totals	42,000	26,000

DULUTH FLAXSEED MARKET SUFFERED FROM WAR-TIME CONDITIONS AND SMALL CROPS

The flax market in 1917 suffered largely from war conditions, but perhaps not so much as did the grains of various kinds. For a time trading in the seed was halted and not a wheel turned. But after a time the ban was taken off flax and trading resumed, but not with the enthusiasm that characterized it earlier in the year, for the rules of the grain exchanges became such as to take the fever of speculation out of the seed.

The dominant note in the market during the active trading in the seed was, first, how much seed would North America produce, for there was a very distinct shortage, Argentina falling away below expectations; in fact, the crop there being virtually a failure. With the shortage of the Southern Republic, it seemed to be up to this country and Canada to furnish the seed, for at the earlier time of trading conditions looked favorable to a very active year. Then came the halt, just as the trading was going good. The seed had reached the unprecedented high mark of $3.79 a bushel, and it might be said in passing that the novelty of the year in the flax market was when it got below $3 a bushel.

Crops Below Expectations.

Following the ban and its taking off, some line was obtained on the domestic and Canadian crops. They were below expectations, and a considerable shortage ensued. But the fever was taken out of it by reason of the fact that the expectations of lively business conditions that would affect flax bullishly failed to develop. Building and improvements to structures not only checked up, but almost came to an abrupt stop. One of the only things which kept the interest up in flax was the demand for oil cake, for nobody wanted oil.

As the Argentine crop, about to be harvested, developed it appeared that it would be one of the largest crops in years, barring unforeseen events, and that appears to be the fact now. For a time this had a depressing effect on the American market, but now the question has arisen as to whether or not ships can be obtained to transport it to this continent. In case it cannot, it will mean another bullish year and one of depression down there. Taken as a whole, trading in flax last year was much slower than in many years.

Acreage and Production.

The following table is compiled from figures published by the United States Secretary of Agriculture:—

	Acreage.	Production in bushels.	Farm value per bushel, Dec. 1.
1917	1,474,000	14,296,000	$2.96
1916	1,605,000	15,459,000	2.48
1915	1,367,000	13,845,000	1.74
1914	1,885,000	15,559,000	1.26
1913	2,291,000	17,853,000	1.23
1912	2,851,000	28,073,000	1.15
1911	2,757,000	19,370,000	1.82
1910	2,467,000	12,718,000	2.32
1909	2,083,000	19,513,000	1.53

Following is a tabulated statement of the range of prices in cash flax and the various options, by months, receipts and shipments, in the several markets of the West, stocks in store, and the like:—

The monthly range of closing prices for cash seed on the Duluth market in the calendar year of 1917, compared with the previous year, follows:—

Closing Prices for 1917-1916.

	1917	1916
January	$2.85½@2.92	$2.17¾@2.42¾
February	2.78 @2.86	2.23 @2.34
March	2.79¼@2.95½	2.15¾@2.32½
April	2.98 @3.39	2.01 @2.19¼
May	2.95 @3.64	1.84½@2.05¾
June	2.85½@3.28	1.76 @1.86
July	2.69 @3.35	1.80 @2.11½
August	3.28 @3.79	2.05 @2.26½
September	3.24 @3.57	2.02½@2.31
October	2.99¾@3.27	2.43 @2.72
November	3.31 @3.47	2.65¾@2.94½
December	3.20½@3.59	2.79 @2.96

Cash at Minneapolis.

The monthly range of prices for cash seed at Minneapolis in the same year, with similar comparisons, follows:—

	1917	1916
January	$2.83¼@2.94	$2.14¾@2.41¼
February	2.75 @2.88½	2.24 @2.38½
March	2.75¼@3.00	2.14¾@2.35½
April	2.93½@3.39	1.99 @2.22¼
May	2.92 @3.61	1.84 @2.09¾
June	2.81½@3.32	1.73½@1.89
July	2.64 @3.36	1.77 @2.12
August	3.27 @3.76	2.03 @2.28
September	3.16 @3.51½	1.99¾@2.32
October	3.01½@3.30½	2.39 @2.70
November	3.16 @3.43	2.59¾@2.93¼
December	3.21 @3.57	2.76½@2.94

Closing Prices, May Seed.

The monthly closing prices of May seed at Duluth, compared with prices in the previous year, follow:—

	1917	1916
January	$2.90¼@2.94	$2.21¾@2.44¾
February	2.81 @2.87	2.25 @2.36
March	2.81¼@2.96	2.15¾@2.32
April	2.99¼@3.37½	2.03 @2.16¾
May	2.97 @3.63	1.85 @2.02¼
June	—@—	—@—
July	—@—	—@—
August	—@—	—@—
September	—@—	2.05½@2.33
October	2.96 @3.16¾	2.43 @2.71
November	3.08 @3.23¾	2.68¾@2.98
December	3.19¼@3.47	2.83 @2.98

Closing Prices, July Seed.

The monthly range of closing prices for July seed during 1917, compared with the same option during the previous year, follows:—

	1917	1916
January	$2.90¾@2.95¾	$2.30½@2.44½
February	2.81½@2.85½	2.25 @2.36½
March	2.82½@2.98	2.15½@2.32½
April	2.97 @3.56	2.03 @2.16¾
May	2.97 @3.56	1.95½@2.06¾
June	2.85½@3.30	1.76½@1.87
July	2.69 @3.35	1.80 @2.11
August	—@—	—@—
September	—@—	—@—
October	—@—	—@—
November	—@—	—@—
December	3.15½@3.41	—@—

Closing Prices, September Seed.

The monthly range of prices for September seed at Duluth, as compared with those of the previous year, follows:—

	1917	1916
January	—@—	—@—
February	—@—	—@—
March	—@—	—@—
April	$3.10½@3.32¼	—@—
May	2.98 @3.47	$1.80½@1.95
June	2.85 @3.15	1.78 @1.87
July	2.71 @3.30	1.82 @2.11
August	3.30 @3.79	2.05 @2.26
September	3.24 @3.53	2.01¾@2.29
October	—@—	—@—
November	—@—	—@—
December	—@—	—@—

October Seed's Closing Prices.

The monthly range of prices for October seed at Duluth in 1917, with comparisons of the previous year, follows:—

	1917	1916
January	—@—	—@—
February	—@—	—@—
March	—@—	—@—
April	$2.91 @3.00	—@—
May	2.81 @3.33	$1.77 @1.84½
June	2.75½@3.05	1.76½@1.83
July	2.70 @3.30	1.82 @2.11
August	3.30 @3.73	2.06¼@2.27½
September	3.24 @3.49¼	2.02½@2.29
October	2.99¾@3.30½	2.41 @2.27
November	—@—	—@—
December	—@—	—@—

November Seed.

The monthly range of closing prices for November seed in this market in 1917, with comparisons of 1916, follows:—

	1917	1916
January	—@—	—@—
February	—@—	—@—
March	—@—	—@—
April	—@—	$2.86 @2.92
May	—@—	1.74 @1.90
June	—@—	1.74½@1.82
July	$3.25 @3.30	1.82 @2.00
August	3.30 @3.71	2.06¼@2.27½
September	3.22½@3.48½	2.03 @2.29½
October	2.99½@3.31	2.41 @2.70
November	3.15½@3.38	2.66¾@2.92
December	—@—	—@—

December Seed.

The monthly range of closing prices for December flax on this market in 1917, as compared with those of the previous year, follows:—

	1917	1916
January	—@—	—@—
February	—@—	—@—
March	—@—	—@—
April	—@—	—@—
May	—@—	—@—
June	—@—	$1.78¾@1.82
July	—@—	1.81½@2.06
August	$3.34 @3.70	2.05½@2.25½
September	3.19½@3.42½	2.02¼@2.28½
October	2.94¼@3.16¾	2.38¾@2.66¼
November	3.10 @3.20¾	2.63¼@2.91¼
December	3.20½@3.59	2.76 @2.92½

Receipts by Months.

Receipts of flax, by months, in Duluth during the past year, compared with 1916:—

	Bushels 1917.	Bushels 1916.
January	248,588	461,658
February	114,066	223,206
March	222,549	39,164
April	156,438	32,090
May	346,425	39,077
June	106,458	70,028
July	129,159	121,137
August	71,661	168,550
September	183,946	33,488
October	271,615	909,383
November	838,407	3,609,609
December	538,529	1,444,954

Shipments by Months.

Shipments of flax from Duluth during the past year, with the usual comparisons, follow:—

	Bushels 1917.	Bushels 1916.
January	88,979	28,298
February	15,332	22,398
March	13,441	12,155
April	46,608	428,015
May	125,730	19,674
June	878,159	25,089
July	353,548	755,425
August	240,864	755,425
September	150,459	422,958
October	307,482	304,843
November	375,593	2,622,152
December	783,855	2,696,508

Receipts at Minneapolis.

Receipts of flax at Minneapolis in 1917, compared with those of 1916, were as follows:—

	Bushels 1917.	Bushels 1916.
January	544,260	319,470
February	441,550	398,800
March	441,220	810,160
April	383,840	485,880
May	263,000	440,250
June	565,000	362,860
July	325,000	440,850
August	92,000	199,300
September	265,000	315,590
October	967,600	2,380,410
November	1,112,240	1,693,890
December	613,670	1,044,740

Shipments from Minneapolis.

Shipments of flax from Minneapolis during 1917, compared with those of 1916, were as follows:—

	Bushels 1917.	Bushels 1916.
January	57,420	108,700
February	77,540	37,570
March	103,110	27,020
April	49,810	12,120
May	122,160	25,540
June	17,280	6,970
July	76,410	16,060
August	22,470	34,250
September	27,040	10,440
October	76,920	229,100
November	424,420	467,970
December	117,570	117,960

Receipts at Chicago.

Receipts of flax at Chicago in 1917, compared with those of 1916, were as follows:—

	Bushels 1917.	Bushels 1916.
January	55,000	36,000
February	43,000	30,000
March	26,000	54,000
April	39,000	38,000
May	290,000	204,000

Mutual Chemical Company of America

BICHROMATE OF POTASH

BICHROMATE OF SODA

55 John Street New York, N. Y.

Factories:

Jersey City, N. J. Baltimore, Md.

June	238,000	.....
July	10,300	19,000
August	52,000	57,000
September	.....	188,000
October	114,000	158,000
November	259,000	176,000
December	96,000	.....

Shipments from Chicago.

Shipments from Chicago, together with figures for comparison, were:—

	Bushels	
	1917.	1916.
January	9,000	.....
February	2,000	1,000
March	4,000	2,000
April	1,000	1,000
May	.....	8,000
June	1,000	10,000
July	1,000	2,000
August	9,000	.....
September	.....	1,000
October	2,000	.....
November	5,000	1,000
December	8,000	.....

Stocks in Store.

Stocks in store in Duluth and Minneapolis on the last day of each month in 1917 and 1916 were as follows:—

Duluth.

	Bushels	
	1917.	1916.
January	1,317,200	1,438,278
February	1,469,733	1,658,609
March	1,685,096	1,709,063
April	1,826,266	1,754,604
May	1,234,415	1,360,664
June	488,740	1,537,732
July	347,002	1,635,965
August	186,352	1,055,217
September	239,281	646,721
October	204,947	1,303,805
November	667,761	1,210,000
December	131,976	1,126,004

Minneapolis.

	Bushels	
	1917.	1916.
January	516,006	265,003
February	519,523	214,731
March	458,321	148,418
April	239,098	118,209
May	128,658	82,240
June	166,456	50,569
July	100,481	21,797
August	4,923	5,374
September	19,202	7,081
October	95,322	56,672
November	57,602	249,569
December	93,406	327,890

CANADA FLAX CROP.

Total Only About 8,000,000 Bushels—Generally Sold Above $3 Mark.

The flax crop of western Canada for 1917, though small in bulk as compared with that of a few years back, when it aggregated 25,000,000 bushels, was of excellent quality and has generally sold above the $3 mark. The last estimate of the crop sent out by the Northwest Grain Dealers' Association gave the total at 6,000,000 bushels, but it is considered by many in the trade that this estimate is too low and that 8,000,000 is nearer a correct total.

The season was not favorable to a large acreage or a large crop. It is true that the greater part of the acreage to be put under grain crops in the spring of 1917 had to be plowed in the spring, and it was generally thought this would mean a large flax acreage, as flax could be sown later than any other grain. May was, however, extremely dry, and June 1 saw practically a suspension of all plowing for land to put in barley and flax. A copious rain about June 12 brought about new efforts to plant flax and a considerable acreage in late flax was sown. On the whole, the season was very dry and premature reports of the ruin of the entire flax crop in Manitoba and Saskatchewan were frequently in circulation.

Alberta.

Alberta's crop never was in danger. The backwardness of the crop was cause for much anxiety on the subject of frost, but these fears were groundless, as the bulk of the crop was saved in an undamaged condition, and has sold as grade No. 1 Northwest Canada on the market. The bulk of the Western flax is grown in Saskatchewan and Alberta. In Manitoba production is comparatively small. The practice prevailing a few years ago of planting flax on early new breaking is being discontinued. Some really excellent crops were grown by this method, but it was found to be very uncertain as to results and very exhausting on the soil, the wheat crop following flax on breaking not being very satisfactory.

As regards prospects for 1918, they are certainly encouraging. There was a very large acreage of fall plowing done, and this means an early ending of wheat seeding, and consequently plenty of time to devote to the sowing of coarse grains. It is expected that 15,000,000 acres will be sowed to wheat this year and a corresponding increased acreage in flax, oats and barley. Much will, of course, depend on weather conditions and the prospects of prices being maintained at or near their present level. While it is recognized here that Argentine shipments will be the dominating factor in the world's flax markets for some time to come, and through trade authorities consider the world's flax supply as sufficient for the world's demands, it is also acknowledged that American flax from its propinquity to the chief consumptive markets occupies a very strong position.

It is certain that there is no likelihood of a falling off in demand. The reconstructive period following the war will mean an enormous consumption of oil, but it is not only from war-stricken Europe that an after-war demand will come into existence. From motives of economy painting has been put off until longer neglect will mean enormous losses from depreciation of plant and house property. This depreciation is universal in western Canada, and it is probably a world-wide condition.

More Oil Cake Consumed.

During the past year there has been a very marked increase in the consumption of oil cake in western Canada. The high prices of mill feed and coarse grains has given an impetus to the trade in this by-product of the crushers. Many Western feeders have for the first time made use of cake. Having become acquainted with its value in finishing cattle for the butcher, they are likely to permanently use it in their business.

Considerable interest is being taken in projects now on foot to utilize the flax straw, so many thousand tons of which are burned annually on the Western prairies. It is claimed that it can by certain processes be transformed into flax cotton, which can be spun into yarn and utilized in all ways in which cotton is used. A less expensive process, it is claimed, will turn the flax straw into a substitute for hemp very suitable for the manufacture of binding twine.

Winnipeg is the center of the flax market of the West. Quotations on flax futures are always present on the call board of the Winnipeg Grain Exchange. The flax is inspected in the city en route to the terminal storage elevators at Fort William and Port Arthur. There is a close connection between the Winnipeg and Duluth flax markets and a large amount of American capital is invested annually in the Western flax crop.

Speculative trading in flax never has reached large proportions here. It is a very lively grain, fluctuating widely, and brokers require a very heavy margin to cover trades. The present high prices on all other grains mitigate against greatly increased acreage in flax this year. The great effort will be to grow wheat, but as a secondary crop flax offers very enticing possibilities, and it will no doubt receive due measure of attention.

Movement of Crop.

The movement of flax of the 1917 crop from September 1 to the middle of December was as follows:—

	1917.	1916.
Flax inspected	2,602,600	2,868,800
Flax received at terminals.	2,247,800	2,620,064
Shipped from terminals....	1,969,000	2,441,312

Balance in farmers' hands to market not less than 4,000,000 bushels.

SMALLEST FLAX CROP IN YEARS REFLECTED IN NEW YORK LINSEED OIL AND CAKE

From 93@95c. in January Prices for Oil Rose to High of $1.26 in December—Cake Strong and Erratic.

Rapidly changing prices, with the trend well above the levels of the previous season, stood out as the principal feature in the linseed oil and cake markets for the year just closed. At the very outset the situation was considered exceptionally strong, for the crop of the season was small and the amount available was not sufficient to fill the demand prevailing. Consequently the Argentine was depended upon for supplies, but unfortunately the surplus there was much below expectations. Difficulties of shipping were also against the trade. In January the business put through was on the basis of from 93c. to 95c. per gallon, which compared with 68c. to 74c. per gallon paid during the same month the year previous and from 48c. to 49c. per gallon paid in 1915. This level held pretty well during February, but at the end of the first quarter prices were well established at $1 a gallon. The upturn was helped along by small stocks and the disappointing arrivals of Argentine seed, together with the predictions of limited receipts from that country. During April higher prices were recorded, with $1.20 established, but this was bettered in the early part of May, when sales were made at $1.27 per gallon, nearly the high on record.

Slump in June and July.

Bearish factors began to appear at this time and the market slumped during June and July, forcing prices down to $1.11 per gallon, a loss from the high of 16c. per gallon. The high hopes held out by leading crushers for a big demand from the paint and varnish trades were not realized. In fact the buying from that quarter was the smallest in years. Conservation seemed to be the watchword, especially with this country in the world war, and operations in the painting line were reduced to a minimum, the consumption of linseed oil suffering accordingly. Stocks of oil were small, but they could not be used as a market factor with no demand to speak of.

Close Watch on Crop.

Interests watched the new crop developments closely. A July report indicating a final yield of 17,000,000 bushels and a crop condition of 84 per cent. was received favorably, but with the publication of the August report a serious situation was revealed. The crop outlook was reduced to 12,788,000 bushels and the condition to 60.6 per cent. Prices moved up in accordance and oil sold as high as $1.24 per gallon early in September. Another shrinkage in the crop was announced in the Department of Agriculture's report in September, indicating a production of only 11,000,000 bushels with a crop condition of 50.2 per cent. The loss was discounted for both the prices of seed and oil started downward, selling as low as $1.13 per gallon early in November. The October and November reports of seed production were discouraging and finally the December statement officially reported the crop grown this year in the United States at only 8,473,000 bushels, the smallest in 10 years. While the crop was rapidly deteriorating, the outlook in the Argentine was favorable and the early estimates were for an exportable surplus of 40,000,000 bushels. This helped some. But how the seed was to be imported was a problem not easily solved, in view of the scarcity of tonnage and the reports that the United States Government had considered that linseed was not an essential commodity for the successful carrying on of the war. As the season progressed early frost set in and the crop in the southern provinces was damaged, forcing a reduction in crop estimates, the export surplus finally being placed at 26,000,000 bushels. In view of these bullish factors prices of oil strengthened materially as the year closed, sellers in December receiving for spot goods from $1.20 to $1.26 per gallon. The high of the year was $1.27 and the low 93c. per gallon.

Northwestern mills were surely handicapped by conditions the past year. Shortage of labor, high producing costs, car scarcity and freight congestion, together with the small crops, were all factors tending to reduce the output. Prices were high, but this was not sufficient to offset these factors.

Linseed Meal Prices.

The greater part of the year saw nothing but nominal prices for linseed meal in the Eastern markets. It was impossible to do business with the European countries remaining neutral, no export licenses being granted. At the West the demand was good and the prices paid were the best obtained in many years. The market for cake was much higher than that quoted a year ago. This, too, was purely nominal. The main feature was the final settlement of the large amount of stock held in steamers, principally at this port, for the account of the Dutch Government. It was bought early in the year for shipment, but after war was declared exports were forbidden. Apparently this was held with the hopes that sooner or later these boats would be allowed to sail, but in the end the agents of the Dutch Government decided to sell the stock with the aid of the State Food Commission.

New York Prices, Carloads, Spot.

The following table shows the prices at which car lots were quoted on spot in the New York market on each Saturday of the year, together with comparisons:—

	1917.	1916.	1915.	1914.
January 6.....	$0.93	$0.68	$0.48	$0.48
January 13.....	.93	.72	.53	.49
January 20.....	.95	.74	.59	.49
January 27.....	.95	.74	.59	.49
February 3.....	.94	.72	.57	.48
February 10.....	.93	.74	.56	.46
February 17.....	.93	.75	.56	.49
February 24.....	.93	.77	.55	.50
March 3.....	.93	.77	.54	.50
March 10.....	1.00	.78	.55	.50
March 17.....	1.00	.78	.58	.51
March 24.....	1.00	.77	.60	.51
March 31.....	1.04	.76	.59	.51
April 9.....	1.06	.77	.58	.51
April 14.....	1.14	.76	.59	.51
April 21.....	1.20	.76	.60	.50
April 28.....	1.20	.76	.61	.50
May 5.....	1.20	.75	.63	.50
May 12.....	1.27	.72	.65	.50
May 19.....	1.22	.71	.65	.49½
May 26.....	1.24	.69	.65	.49½
June 2.....	1.20	.67	.64	.49½
June 9.....	1.20	.68	.63	.50
June 16.....	1.17	.65	.61	.50
June 23.....	1.17	.64	.57	.51
July 2.....	1.20	.63	.57	.51
July 7.....	1.12	.64	.54	.51½
July 14.....	1.12	.69	.54	.51½
July 21.....	1.11	.68	.53	.52
July 28.....	1.12	.70	.52	.57
August 4.....	1.17	.71	.51	.59
August 11.....	1.24	.72	.50	.58
August 18.....	1.24	.72	.50	.58
August 25.....	1.24	.72	.50	.59
September 1...	1.24	.70	.52	.58
September 8...	1.22	.70	.52	.57
September 15...	1.20	.69	.51	.56
September 22...	1.18	.72	.51	.55
September 29...	1.20	.76	.55	.51
October 6.....	1.16	.82	.55	.49
October 13.....	1.15	.82	.56	.48
October 20.....	1.12	.87	.58	.45
October 27.....	1.13	.89	.58	.44
November 3...	1.13	.90	.58	.44
November 10...	1.15	.97	.60	.44
November 17...	1.18	.95	.64	.46
November 24...	1.22	.96	.63	.46
December 1...	1.20	.92	.61	.46
December 8...	1.20	.95	.61	.45
December 15...	1.20	.92	.61	.45
December 22...	1.21	.92	.61	.48
December 29...	1.26	.92	.64	.48

Chicago Linseed Cake and Meal Market, 1917.

The outstanding features of the 1917 linseed cake and meal market in Chicago were the good demand from sources which substituted linseed cake for cottonseed meal for cattle feed, the almost complete wiping out of geagraphical lines (the principal factor of trading in former years) and the practical cessation of the exportation of this commodity.

Because of the lack of export business the market was confronted with the unusual situation of the East shipping linseed meal and cake to the West. Some of this, no doubt, was linseed which had originally come from the West while the balance represented the foreign product.

The year opened with meal in 100-pound sacks in carload lots selling at $43 Minneapolis or $45 Chicago. These prices were in effect until about the first of March, when a $2 drop was experienced at both markets. Later in March the spread between Chicago and Minneapolis was reduced to $1, meal being quoted at Minneapolis at $42 and at Chicago at $43. Early in April the market grew $1 stronger all around, and by the latter part of April it had advanced to $45 Minneapolis and $46 Chicago.

On May 17 the market climbed to $47 Minneapolis and $49 Chicago. June, which is usually dull, saw a drop to $45 at both points. A little later, however, crushers realized they were getting to the end of the run and the price jumped to $47 in Minneapolis and $49 in Chicago.

In July it had reached $49 Minneapolis and $51 Chicago. Still later in the same month sales were made at $53 Minneapolis and $55 Chicago. August saw another $2 advance all around, and the market remained fairly steady at $55 Minneapolis and $57 Chicago until the cold weather set in. Toward the close of December the price of meal had reached $59 at both Minneapolis and Chicago.

High and Low, Spot, New York.

The following table gives the high and low price quoted for oil on spot in the New York market, together with comparisons:—

	1914.		1915.		1916.		1917.	
	H.	L.	H.	L.	H.	L.	H.	L.
Jan....	49	48	59	48	74	66	95	93
Feb....	50	48	56	54	77	71	94	90
Mar....	51	50	60	55	78	77	1.04	98
April...	51	50	61	58	77	76	1.20	1.06
May....	50	49½	65	62	76	68	1.27	1.22
June...	51	50	63	57	67	63	1.20	1.17
July....	57	51½	54	52	70	63	1.20	1.11
Aug....	59	58	52	50	72	70	1.24	1.17
Sept....	57	51	55	51	76	67	1.24	1.18
Oct....	49	44	58	55	90	76	1.16	1.12
Nov....	46	44	64	60	97	90	1.22	1.13
Dec....	48	45	64	61	95	92	1.26	1.20
Year...	59	44	65	48	97	63	1.27	98

Crop Estimates by Months.

Official estmates on the domestc crop of flaxseed, as reported monthly, compare as follows:—

	Acreage.	Condition. Per cent.	Yield per acre. Bush.	Total yield. Bushels.
July 1...	1,939,000	90.5	9.1	18,000,000
Aug. 1...	1,939,000	60.6	6.6	12,788,000
Sept. 1...	1,939,000	50.2	5.7	11,000,000
Oct. 1...	1,939,000	51.3	5.8	11,335,000
Nov. 1...	1,939,000	...	5.0	9,648,000
Dec. 15..	1,809,000	...	4.7	8,473,000

Import and Export Figures for 1917.

The following figures show the import and export trade in linseed oil for the crop year from September 1 to August 31:—

IMPORTS OF LINSEED OIL DURING CROP YEAR.

	Gallons	
	1916-17.	1915-16.
September	7	760
October	584	.....
November	50,012	14,941
December	23,499	5,167
January	1,166	73
February	7,270	8,571
March	24	3,086
April	13,598	120
May	7,530	10,718
June	4,021	20
July	40,483	9,011
August	184	3,062
Totals	148,387	50,519

EXPORTS OF LINSEED OIL DURING CROP YEAR.

	Gallons	
	1916-17.	1915-16.
September	77,343	33,072
October	68,692	81,956
November	50,477	47,486
December	58,100	63,422
January	89,680	65,997
February	44,950	63,800
March	146,280	80,018
April	233,632	66,754
May	151,180	69,945
June	149,543	83,552
July	93,733	74,036
August	115,576	67,953
Totals	1,179,186	797,001

Imports for Crop Years, 1915-1916, 1916-1917.

Imports of flaxseed for the crop year, from September 1 to August 31, were as follows:—

	Bushels	
	1916-17.	1915-16.
September	1,040,859	1,361,067
October	1,902,973	1,277,001
November	976,124	1,768,720
December	400,925	1,259,874
January	952,978	698,506
February	808,266	927,054
March	776,619	465,425
April	465,188	626,700
May	1,395,344	1,411,038
June	1,123,731	1,602,119
July	741,552	1,887,037
August	803,477	1,165,345
Totals	10,386,536	14,424,975

Exports for Crop Years, 1915-1916, 1916-1917.

Exports of flaxseed for crop year, from September 1 to August 31:—

	Bushels	
	1916-17.	1915-16.
September	47	158
October	31	156
November	96	148
December	10	154
January	123	62
February	66	24
March	15	1,041
April	317	73
May	29	65
June	173	60
July	14	61
August	.....	58
Totals	915	2,060

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COTTONSEED OIL MARKETS.

NEW YORK COTTONSEED MARKET WAS MARKED BY SHARP ADVANCE IN PRICES

The most remarkable year ever witnessed by the cottonseed oil industry was that of 1917. The main feature of the period under review was the large volume of business on a fairly nominal basis for the first quarter, until the breaking of diplomatic relations with Germany. Consumers were then compelled to buy their supplies only for actual needs. However, when war was declared some interests in the local market considered this a bullish factor, and it was generally admitted that no material weakness was displayed. The consuming demand at the beginning of the year showed pronounced activity. At times interesting price movements were recorded, and an upward tendency noted.

Although the position of the market was far from being normal, consumers were content with the prevailing conditions, but toward the close of the year the situation was affected by rigid laws, the application of which was reflected in the local market for cottonseed oil as well as the entire list of vegetable oils. At this period the Federal Food Administration proposed stringent regulations for the purpose of curbing speculation and excessive hoarding. One law prohibited a crusher of cottonseed from having on hand under contract more than a crush of seed for 60 days, nor was he permitted to hold it more than this period.

Under another of the important provisions dealers in cottonseed meal and cake were not permitted to make any contract for shipment or delivery for more than 60 days from date of such contract. Since these regulations, in conjunction with several others, became operative all active trading in the New York market was curtailed.

Price Uplift Followed.

The restrictions caused a sensational decline in business and a decided advance in the price of cottonseed. The weakness in seed securities, etc., tempted the majority of investors to liquidate their outstanding accounts. This situation continued, and even at the present time such conditions are prevailing with absolutely no prospects for a change.

Reports for the 1918 cotton crop have not been so encouraging at the close of the period. Many authorities state that in analyzing the prospects of 1918 by States, the situation seems to be a critical one. Taking Alabama, for instance, it is reported that the State is so short of labor that 100,000 bales less cotton were raised in 1917 than in 1916, and little hope is placed for production to come back any stronger in 1918. As for Arkansas, it is predicted that but 900,000 bales will be raised. Georgia raised a fair crop in 1917, but is not expected to report so much this year. North Carolina and Oklahoma might do a little better, though it is understood that there is a heavy acreage shown to grain. Unusual rainfall and the right kind of seasons might increase the production of Texas 1,000,000 bales over that of 1917. As for Arizona, it is reported that there will be planted about 100,000 acres of long staple cotton in different vicinities, especially in the localities of Chandler and Phoenix, Ariz. Plans are already being made to handle the crop from this large acreage. Consumption is rapidly overtaking production all over the world. Official reports give the local production in the United States for 1918 to amount to 10,949,000 bales. The production of 1916 in this country was 11,449,530 bales; in 1914, 16,134,930 bales, and in 1912, 13,703,421 bales.

Although prices for cotton are very high at the present time, predictions point to still higher quotations eventually. The idea of the discarding of a few crops and the growing of more grain in the South has placed the cotton farmer in an independent financial position. The farmers' response to the appeal of the President to raise big crops of foodstuffs for home consumption and for the allied nations serves to keep the cotton acreage down to a reasonable area for 1918, notwithstanding the high prices prevailing for the staple cotton and cottonseed.

Government Ginning Figures.

The government cotton ginning figures up to January 15 of this year averaged 97.2 per cent. of the crop. These figures were slightly more than were expected, and it was stated that the Department of Agriculture's estimate of 10,949,000 bales is a minimum. The crop is practically all ginned at present, and it is certain that the final figures will be published around the middle of March. In the past seven years the ginning to January 15, which is the date covered by this report averaged 96.1 per cent. The following is the percentage by years:—

	Per cent.		Per cent.
1917	97.1	1913	93.3
1916	93.8	1912	97.2
1915	97.1	1911	97.2
1914	97.0		

Average for seven years, 96.1 per cent.

An enormous demand for the cottonseed was recorded for almost the entire period. Reports indicate that the seed and its products have been the most important factors in this country, as well as abroad. It is estimated that cottonseed will add from $325,000,000 to $350,000,000 to the value of the cotton crop of 1917. Cottonseed is reported by the Department of Agriculture to have brought the farmer a total of approximately $1,855,000,000. It has advanced from $16.57 per ton in January, 1912, to $70@80 per ton at the present time. Below is a tabulation showing the average price of cottonseed per ton received by planters on the 15th of each month for the last four years as calculated by the Department of Agriculture:—

Average Prices for Four Years.

	1917.	1916.	1915.	1914.
Jan. 15	$52.53	$36.85	$19.14	$22.70
Feb. 15	51.43	36.75	23.33	23.37
Mar. 15	63.18	36.56	22.25	23.60
April 15	55.94	38.13	22.69	24.17
May 15	55.61	37.91	22.07	23.56
June 15	57.19	35.79	20.82	23.62
July 15	56.90	36.06	19.33	22.78
Aug. 15	56.61	35.22	20.14	20.16
Sept. 15	57.58	41.13	20.98	13.88
Oct. 15	65.02	47.73	33.73	15.28
Nov. 15	69.38	55.82	34.01	14.01
Dec. 15	75.00	56.35	35.54	17.73

Cotton Oil.

As for the cotton oil, the market displayed an upward tendency for almost the entire period. For the first six months prices were advancing very sharply. The year opened with crude oil quoted at 83c. per gallon, and in June, $1.10@1.12 was considered the inside price. The summer months, as usual, caused trading to become a little dull, and in August the market fell to a lower level, $1.02. The fall months livened up business a bit, prices advancing to $1.23 per gallon. Owing to the absence of speculation at the close, very little new business was transacted, and as cottonseed advanced to a high level, crude oil sympathized, reaching a figure as high as $1.31¼ per gallon, or 17.50c per pound. The price fluctuations for the period under review covered a range of 49¾c. per gallon, 81c. being the low, and $1.31¼, the high.

COTTONSEED OIL.

High and Low Price Comparison.

The appended table will show the high and low prices of spot refined oil, per pound, and immediate shipments of prime crude oil, per gallon, during the last four years. Prices are based on closing quotations each successive week:—

Prime Summer Yellow on Spot.

	1917. H.	1917. L.	1916. H.	1916. L.	1915. H.	1915. L.	1914. H.	1914. L.
Jan.	12.45	11.95	9¼	8½	6¾	5¾	7½	6¾
Feb.	12.60	12.30	10¼	9¼	7.10	6.80	7.25	7.05
March.	13.50	12.40	10½	10⅛	6.70	6.50	7⅞	7¼
April.	15.25	13.60	11	10½	6¾	6¾	7⅞	7⅞
May	16.20	15.00	11	10.70	6¾	6¼	7.35	7.00
June	16.65	16.30	11	10⅞	6¾	5.95	7⅞	7¼
July	15.50	13.75	11	9.20	6	6	7½	6¾
Aug.	15.25	14.25	9¾	9¼	5¾	5.30	6¾	6¾
Sept.	16.20	15.25	10¾	9¾	6¾	5.98	6¾	5¾
Oct.	18.00	16.50	12½	10¾	7.90	6.91	5½	4.85
Nov.	19.00	18.60	13	12½	8¾	7¾	6¼	5.00
Dec.	18.60	18.60	13	12½	8.32	8.32	6	5¾
Year	19.00	13.95	13	8½	8¾	5.30	7⅝	4.85

Prime Crude Oil for Immediate Shipment in the Southeast During the Past Four Years.

	1917. H.	1917. L.	1916. H.	1916. L.	1915. H.	1915. L.	1914. H.	1914. L.
Jan.	82	81	61	55	43	36½	45	41½
Feb.	84	79	64	63½	45½	42	45½	44½
March.	90	81½	70	64	42½	40½	47½	45
April.	1.00	90	73	70	42	39½	48½	47
May	1.10	1.03	73	69	42	39½	47½	45½
June	1.12	1.10	71	69	39½	38½	47½	46½
July	1.03	91	*	..	*	..	47	44
Aug.	1.02	96	*	..	*	..	41	38
Sept.	1.13	1.02	69	68½	41	36	41	35
Oct.	1.23	1.15	83	70	52	44	34½	29
Nov.	1.30	1.24	88	83	55	49½	37	29
Dec.	1.31¼	1.27	87	82	55	54	37½	36
Year.	1.31¼	79	88	55	55	36	48½	20

Above prices represent the gallon basis.

* Nominal.

High and Low Spot Prices in the New York Market for Middle West Lard, Lard Compound and Oleo Stearine for Each Month During the Years 1915, 1916, *and* 1917.

Lard.

	1915. H.	1915. L.	1916. H.	1916. L.	1917. H.	1917. L.
Jan.	10⅝	10½	10.50	9.90	16.30	15.50
Feb.	10⅝	10½	10.50	10.20	17.00	15.90
March.	10⅝	9⅝	11.75	10.20	19.70	17.40
April	9½	9⅝	12.80	11.75	21.65	20.30
May	9½	9¼	13.05	12.80	22.87	21.55
June	9¼	8	13.40	13.05	22.85	21.00
July	7⅞	7¼	13.40	12.75	20.50	19.50
Aug.	7⅞	7⅞	14.50	12.87½	22.80	21.30
Sept.	8¼	8	15.00	14.30	24.50	22.70
Oct.	10	9⅜	17.00	15.00	25.30	23.25
Nov.	9⅜	8¾	17.40	17.00	26.00	25.50
Dec.	9¾	9⅜	17.40	16.30	26.10	24.70
Year.	10⅝	7¼	17.40	9.90	26.10	15.50

Lard Compound.

	1915. H.	1915. L.	1916. H.	1916. L.	1917. H.	1917. L.
January	7½	7⅜	10½	9⅜	14¾	13¾
February	7⅜	7⅜	10⅝	10¼	10¼	13¾
March	7¾	7⅜	11⅜	10⅜	15	13⅞
April	7⅜	7⅛	12¼	11⅜	18	14⅜
May	7⅛	7	12¼	10⅝	18½	17½
June	7⅛	7	12¼	10⅝	17⅛	16
July	7⅛	7	12¼	10⅝	16⅝	16
August	7	7	11	10⅛	16	16
September	7⅜	7	12½	10½	18	16
October	9¾	8½	14⅜	12½	21	19¼
November	10⅜	9½	15¼	14⅜	22¼	20⅛
December	9⅞	9½	14⅜	14⅞	23½	22
Year	10⅜	7	15¼	9⅝	23½	13⅜

Oleo Stearine.

	1915. H.	1915. L.	1916. H.	1916. L.	1917. H.	1917. L.
January	10	10	10	8¾	14½	13
February	10	10	10	9¾	13¾	13
March	10	8½	11¾	9¾	15	12¼
April	9¼	8½	11¾	11¾	17½	14¾
May	9¼	8¾	12	11¾	20	17½
June	9¼	8¼	12	10¾	21½	18
July	8¼	8	11	10	18	16½
August	10	9	10¼	10	19	16
September	9¾	9¾	10¼	10½	20½	19
October	10½	9¾	15	14¼	23	21½
November	11	10½	15½	15	23	21
December	10½	9¾	15½	15	21	18½
Year	11	8	15¼	8¾	23	13

Chicago Cottonseed Oil Market.

Early in 1917 the soapmakers were heavy consumers of cottonseed oil, due to the scarcity and high prices of other fats and the reasonable price of cottonseed oil. Later in the year a terrific demand for cottonseed oil was manifested by the compound manufacturers, and this continued throughout the year because of the scarcity of pure lard.

These conditions, of course, led to record-breaking prices. Prime summer yellow, bleachable cottonseed oil climbed from 9ic. in January of 1917 to $1.44½ a gallon, loose basis, in December.

The discount at which compound sold as compared to the price of pure lard in 1917 induced the masses to turn to compounds and margarines as substitutes both for lard and butter. In the same way the scarcity of olive oil, resulting from the establishment of embargoes on that commodity by Spain and Italy, led to the extensive use of cottonseed oil as a salad oil.

The year saw the establishment in the territory around Chicago of several new industries using cottonseed oil almost exclusively. While most of the trading in this oil was done at New York, the bulk of the commodity was used for manufacturing purposes in and near Chicago.

The interest in cottonseed oil in the Middle West became so strong that the Chicago Board of Trade appointed a committee to consider the advisability of establishing trading in the commodity on the local board. This committee after several months of investigation not only decided to recommend that such a step would be advisable, but even began the preparation for the rules for trading. While this work was far advanced, government regulation and control became so manifest in other lines that the question of trading in cottonseed oil at Chicago was tabled indefinitely by the committee.

High and Low by Months.

The following is the monthly range of cottonseed oil in Chicago for 1917:—

January	$0.91 @0.95
February	.91 @ .96
March	.96 @1.12½
April	1.12½@1.14½
May	1.14½@1.21
June	1.19½@1.27
July	1.16 @1.23
August	.99½@1.09
September	1.11 @1.35
October	1.24½@1.49
November	1.35 @1.43¾
December	1.36½@1.44½

OTHER VEGETABLE OILS IN 1917.

Prices at End of Year Highest on Record—Supply Somewhat Handicapped by Import Regulations.

COCONUT OIL.

The year under review has been one of great importance for practically the entire list of vegetable oils. Prices at the end of the period closed steady, with the highest record ever attained. The coconut oil market for 1917 was much higher than during 1916. The supply of both the Ceylon and Cochin grades of coconut oil, despite the British regulations and restrictions which made shipping facilities more difficult, was by no means below normal, and would have been increased had it not been for restricting regulations.

Imports of copra from the Far East for 1917 showed an increase over those of the former year. For the ten months ending October, 1917, 280,985,451 pounds were imported into the United States, against 119,235,667 pounds for 1916, and 87,629,304 pounds for the same time in 1915.

The most interesting developments have come in the utilization of oil for edible purposes, especially since this country has been involved in the war, with full significance of the necessity of conserving home supplies. The first consideration is due this product, of which the country's consumption is placed at about 1,000,000 barrels, almost double that of the previous year. The total output of the world is estimated at about 2,500,000 barrels, with Germany the principal factor. It has been stated that approximately twenty plants are engaged in the domestic industry.

Prices Were Higher.

Quotations for the different grades during the year just closed have been much higher than those during 1916. The domestic Cochin grade, at the opening, was held at 16c. and the edible at 17½c. On July 1, prices were at a higher level, 18c. being quoted for the Cochin and 21c. for the edible. On December 30, the Cochin was quoted at 20c. and the edible at 22c. The price fluctuations of the Cochin for 1917 covered a range of 4c. per pound, the low being 16c. and the high 20c. per pound.

Imports of coconut oil for the 10 months ending October, 1917, were 125,279,157 pounds, against 56,282,867 pounds for the corresponding period of 1916, and 57,492,852 pounds in 1915.

The Ceylon coconut oil market, during the period just closed ranged in price from 13½@17¾c. per pound. On January 1, 14c. was the price quoted for this commodity; on July 1, 16¾c. was the best available figure, and on December 30, the high level of 17¾c. per pound was reached.

Ceylon, High and Low.

The following table gives the high and low price for each month, from January, 1915, to December, 1917, on Ceylon coconut oil, the figures being based on the closing spot quotation of each successive week:—

	1915. H.	1915. L.	1916. H.	1916. L.	1917. H.	1917. L.
January	11	10⅜	13	12½	14	13½
February	11	11	14	13	15	13½
March	11	10⅜	15	14½	15	14½
April	10⅜	10½	16	15	15	14½
May	10½	9½	16	15½	17	14⅜
June	9½	8⅜	15½	14½	17½	16½
July	9	8⅜	14	13	16⅜	15
August	8⅜	8⅜	12½	12	16½	15¼
September	9¼	9	12	11	16½	16
October	9⅜	9½	13½	12½	16⅜	16¼
November	11¾	10	14	13½	17¾	16¾
December	13¾	12	14½	14	17¾	17¼
Year	13¾	8¾	16	11	17¾	13½

Note.—The prices are for coconut oil in barrels.

Cochin, High and Low.

Following are the high and low spot prices for Cochin coconut oil, by months, for 1915, 1916, and 1917:—

	1915. H.	1915. L.	1916. H.	1916. L.	1917. H.	1917. L.
January	15	14	15½	15	17	16
February	14½	14½	15½	15	17	16½
March	14½	14	17	15½	17	16
April	13½	11½	18	17	17½	16
May	11½	10½	17	16½	20	17
June	10½	10¼	16½	15	19	17¼
July	10½	10¼	15	14	18	16½
August	10¼	10	13½	13	17¼	16½
September	10½	10¼	14	13¼	17½	16¾
October	11¼	10½	16	14	18	17¼
November	14	11	17	16	18¼	17¾
December	15½	14¾	17	16	19	18
Year	15½	10	18	13	20	16

CORN OIL.

Production of corn oil in the United States showed a decided decrease during 1917. Crude and refined corn oil prices for the period under review greatly exceeded those of 1916. Production of corn oil in 1917 is estimated at 200,000 barrels in comparison with over 300,000 barrels for 1916. For the first eight months edible oil moved very slowly. The year opened with sellers asking from 11.20c. to 12.50c. per barrel in car lots, New York. In June the price of edible oil was advanced to 15@15.85c. per pound. The summer, as usual, dulled the activities of the market and in July the available stock was obtainable as low as 13@14.25c. At the end of 1917 leading refiners began to drop out of the market and the edible product was practically unobtainable. The market was firm during the winter, reaching a very high level, and in December 18@18.50c. per pound was considered the best figure.

The refined product showed little activity during 1917, with prices advanced almost 75 per cent. since the beginning of the year. The year opened with 12.51@13.06c. per pound; in June prices advanced to 16.26@17.11c., and during the summer prices took a lower level at 16.31c. per pound.

High and Low, Crude.

The following table gives the high and low price of crude corn oil, by months, during 1915, 1916, and 1917:—

	1915. H.	1915. L.	1916. H.	1916. L.	1917. H.	1917. L.
January	5.80	5.70	8.75	7.85	12.50	11.25
February	6.25	5.80	9.51	8.75	11.75	11.50
March	6.26	6.25	10.00	9.75	12.31	11.75
April	6.26	6.26	10.25	9.75	14.75	12.75
May	6.50	6.26	9.75	9.50	15.85	15.26
June	6.26	6.01	9.50	8.70	15.85	15.00
July	5.86	5.56	8.41	7.96	14.25	13.00
August	5.65	5.50	7.75	7.61	14.75	13.00
September	6.45	5.65	9.25	8.36	16.00	14.75
October	7.75	6.45	11.75	10.00	17.25	16.25
November	7.75	7.50	12.25	12.00	18.50	17.00
December	7.85	7.75	12.75	12.25	18.50	18.00
Year	7.85	5.56	12.75	7.85	18.50	11.25

High and Low, Refined.

The following tabulation shows the high and low price of refined corn oil during each month of 1915, 1916, and 1917:—

	1915. H.	1915. L.	1916. H.	1916. L.	1917. H.	1917. L.
January	6.75	6.55	9.42	8.45	13.06	12.51
February	7.25	6.75	10.46	9.40	12.81	12.51
March	7.25	7.25	11.11	10.46	13.31	12.51
April	7.25	7.25	11.11	10.26	16.91	13.51
May	7.50	7.25	10.81	10.61	16.91	16.51
June	7.00	6.75	10.81	10.41	17.11	16.26
July	6.35	5.95	10.41	9.16	15.91	14.91
August	6.15	6.05	9.16	8.91	16.31	15.21
September	7.15	6.15	10.61	9.86	17.81	16.31
October	8.25	7.15	12.51	10.86	20.06	17.96
November	8.25	8.00	13.51	13.01	20.96	20.11
December	8.45	8.25	14.01	13.01	20.96	20.66
Year	8.45	5.95	14.01	8.45	20.96	12.51

Note.—Prices for corn oil are in dollars and cents per 100 pounds, car lots, cooperage basis.

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OLIVE OIL.

The trend of values pointed upward throughout the entire year. Before the outbreak of the war, olive war was available at $1.05@1.20 per gallon; in July it was quoted at $1.60, and at the close of the year $3 per gallon was the best available quotation. This shows an advance in price of almost 200 per cent. since the outbreak of the war. Quotations of the oil showed a wide variance, but the disposition on the part of most holders to conserve supplies, put the market on a fairly nominal basis.

The most striking changes which denatured olive oil and olive oil foots have undergone are based primarily upon the embargo on Spanish exports. This embargo became active in July, and its main object was to restrict exports only until the middle of November. However, the necessity of conserving home supplies was such that the suspension of the embargo has been extended indefinitely, and it is said by some Spanish authorities that this restriction may extend for the duration of the war.

Olive crops have been much larger last year than they have been for several years previous. A report from France indicates that the French output has been the largest in twenty years, amounting to almost 174,000 metric tons of olives, yielding approximately 8,000,000 gallons of edible oil, and 65,000 metric tons of oil cake.

Prime foots were far from being firm during 1917. In January, olive foots were quoted at 10@11½c.; in July at 19½@20c., and in December 34@42c. seemed to be the best available price.

High and Low, Denatured Yellow.

The subjoined table gives the high and low prices for each month, from January 1, 1915, to December 31, 1917, with the average price for each year on denatured yellow olive oil, the figures being based on the closing quotations of each successive week:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	95	90	92	92	1.20	1.05
February	88	82	96	92	1.50	1.17
March	90	68	96	94	1.55	.80
April	90	90	95	95	1.40	1.30
May	92	90	94	90	1.55	1.35
June	90	86	90	96	1.70	1.50
July	86	84	88	86	1.80	1.60
August	85	82	88	88	2.00	1.75
September	85	85	94	91	2.15	1.95
October	88	85	1.06	96	2.45	2.26
November	90	88	1.05	1.05	2.50	2.35
December	92	90	1.07	1.05	3.00	2.75
Year	95	82	1.07	90	3.00	1.05

High and Low, Prime Foots.

Following are the high and low prices for prime olive oil foots, by months, for 1915, 1916, and 1917:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	9¼	8¾	9¾	9½	11¼	10
February	8	7¾	11¼	9¾	13	11
March	8¾	8¼	12	12	13½	12
April	8¾	8¾	12¼	11¼	15	13½
May	9	8¾	12¼	11¾	15½	14½
June	9	8½	10¾	10	20	18
July	8½	7¾	9	9	20	19
August	8	7¾	9	9	22	19½
September	8	8	9½	9	25	20
October	8¾	8	9¾	9½	30	25
November	9	8	10	10	35	28
December	9½	9¼	10	10	42	34

PALM OIL.

While high prices prevailed for both the Lagos and Niger grades of palm oil during 1917, trading was fairly active. At the opening of the year demands of the tin plate manufacturers were fairly well satisfied. During the summer and winter months there was a great scarcity of Lagos oil with a very urgent demand from the tin plate trade, which leading consumers found themselves unable to meet. During November and December months Lagos was practically all cleared from the market. It was stated that the stringent rules laid down by the United Kingdom had practically crippled the palm oil market. Owing to the inability of the United States Government to secure shipping permits from the United Kingdom, manufacturers of this country who required this article faced an excessively serious situation. At times it was felt that the United States would underake negotiations to remedy this evil. Practical results are anticipated through the agency of the government-directed Oil and Oil Seeds Association, now working with the Import Board.

Imports of palm oil for the fiscal year ending June, 1917, were 1,249,688 pounds, valued at $159,123, against 1,072,494, valued at $108,568, in 1916. In January Lagos oil was quoted at 12½@13½c. per pound, and in December consumers were satisfied to buy this commodity at 26@31c. per pound, which is almost 100 per cent. increase since the beginning of the year.

For the lower grade the market was somewhat irregular throughout the entire year. Niger oil ranged from 12c. to 30c. per pound.

High and Low, Lagos.

The following table gives the hgh and low for Lagos palm oil in the New York market during 1915, 1916, and 1917:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	8	7¼	10¼	9¼	13½	12½
February	11½	9½	12	10½	14½	12½
March	12½	11½	17½	12½	14½	13½
April	11½	10½	20	17	14	13¾
May	10½	8	16	13	17½	14¼
June	8	6¾	12	11	18½	17
July	7	6¾	11	10½	18¼	17
August	7¼	6¾	10	9½	18	17
September	6¾	6½	9½	8	21	18¼
October	7¼	6¾	12	9½	21	19½
November	8½	7½	12¾	12½	25	21
December	9	8½	13	12¾	31	26
Year	..	..	20	8	31	12½

High and Low, Prime Red.

The following table gives the high and low price of prime red palm oil (Domy) for each month in 1915, 1916, and 1917. The quotations are based upon the closing price of each successive week:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	7	6¾	9¾	8¾	12½	12
February	11	8½	10	9¾	14	12
March	11½	11¼	16	10¾	13½	13
April	11¾	10	17	15	13½	13
May	10	7¾	15	11	15½	13¼
June	7¾	6½	11	10	16½	15
July	6¾	6¾	19	10	17½	16
August	6¾	6½	9½	8½	17¾	16
September	6½	6¾	8½	7½	19	16¼
October	7	6¼	11	9	19½	17½
November	8	7	12	11½	23	19
December	8½	8	12½	12¼	30	27
Year	11½	6¾	17	7½	30	12

PALM KERNEL OIL.

The palm kernel oil market in the United States during the year was devoid of feature. Similarly to palm oil, the stringent regulations set by the United Kingdom greatly affected exports to this country, and prices were stiff and nominal throughout. Imports for the fiscal year ending June, 1917, were 209,576 pounds, valued at $28,213, in comparison with 352,326 pounds, valued at $44,854 for 1916. Imports of kernels during September, 1916, were 485,122 pounds, valued at $48,746, against only 306 pounds, valued at $31, in September, 1917, showing a decline of almost 1,000 per cent.

Congestion, arising from lack of shipping facilities, existed along all West African ports, and it was estimated that along the entire coast, from Calabar to Sierra Leone, over 1,000,000 quintals of palm kernels were awaiting exportation during the early months. There is little doubt that the importation will be an important factor during this year, and steps have already been taken by the leading pressers of this country in preparing their machinery to handle these kernels. The price fluctuations for 1917 covered a range of 3¾c. per pound, the low being 14¾c. and the high being 18c. per pound.

High and Low Prices.

The following table gives the high and low spot quotations for palm kernel oil, by months, during the past three years:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	12	11½	12¼	11¾	14¾	14½
February	12	12	13	12½	14¾	14½
March	12	11¾	15½	13½	15	14½
April	12	11¼	16	16	17	16
May	11¼	10	16	15¾	19	16½
June	10	9¾	15½	14½	18	16½
July	9¼	9	14	13	17	16½
August	9¼	8½	13	12½	16	15½
September	8½	8¾	12¼	12	17	15½
October	9¼	8¾	13½	13	17½	16½
November	10¾	9¼	14	13½	17½	17
December	11½	11	14¼	13½	18	17½
Year	12	8¾	16	11¾	18	14¼

PEANUT OIL.

The main features of the peanut oil market were the high prices which were chiefly based upon the small crops in the South. Shipments from the Southern States were not very large, and from September to December crude oil advanced 18@20c. The exports of peanut oil from Tsingtau, China, in 1917, were over 31,000,000 pounds, almost double those of 1916. The Tsingtau peanut oil is becoming more and more known in the American market, owing, mainly, to the care with which it is prepared. The firmer position for crude oil was chiefly in sympathy with cottonseed oil, and toward the end, peanut oil has been rather heavy.

The year opened with crude peanut oil quoted at 86c. per gallon. For the entire year the tendency of the market was upward. In April, crude was advanced to $1.15 per gallon. June and July, the coming of summer, caused business to become a little inactive. For the last three months, the market was firm, and prices steadily advanced. The year closed covering a range of 53c. per gallon, $1.38 being the high and 85c. per gallon, the low.

The edible product has been on a much firmer scale during the last year, and opportunities of the industry seem to be much more promising for this year. The domestic production has been incapable of satisfying the heavily increasing home consumption, and the imports for last year show a great increase of almost 300 per cent. over those of 1916.

High and Low, Crude Peanut.

The following table gives the high and low price of crude peanut oil in New York for each month of 1915, 1916, and 1917:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	70	68	64	64	.86	.85
February	68	65	68	66	.90	.85
March	68	65	74	68	1.00	.90
April	66	65	78	74	1.15	.95
May	66	65	78	74	1.15	1.15
June	70	66	76	74	1.20	1.15
July	65	65	75	72½	1.20	1.15
August	65	65	72	70	1.25	1.15
September	66	66	74	72	1.20	1.17
October	68	66	80	74	1.25	1.20
November	66	66	88	84	1.38	1.25
December	68	66	90	86	1.38	1.34
Year	70	65	90	72½	1.38	.85

RAPESEED OIL.

Trading in rapeseed oil was normal for the first quarter of 1917, and prices were firmly held at $1.10 per gallon. Throughout the entire year, stocks of English and refined oil were exceedingly limited, and prices were reported the highest on record. There was quite an urgent demand for the Japanese oil, but only a small quantity was obtainable to satisfy actual wants. During the entire period an active inquiry was made for English refined rapeseed oil for shipment from the Pacific Coast and the Orient, but owing to poor shipping facilities this was virtually impossible.

English refined oil opened the year at $1.10 per gallon, and continued so until April, when sellers were asking as high as $1.30. Prices advanced steadily until June, and then eased off during the summer months. In the fall, the situation again strengthened, and by December sellers were satisfied to obtain the oil at a price as high as $1.70 per gallon. Price fluctuations for the period under review covered a range of 10c. per gallon, the low being $1.60 and the high, $1.70 per gallon. Imports of rapeseed oil for the fiscal year ending June were 29,151 gallons, valued at $23,550, against 543,311 gallons valued at $310,959, for the same period of 1916. The 10 months' imports, ending October, totalled 887,743 gallons, against 2,485,633 gallons for 1916.

High and Low, English Refined.

Following are the high and low prices for English refined rapeseed oil, by months, for 1915, 1916, and 1917:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	71	70	1.05	.96	1.12	1.10
February	84	72	1.05	1.02	1.12	1.10
March	85	84	1.05	1.02	1.12	1.10
April	85	82	1.05	1.05	1.30	1.20
May	83	81	1.00	.98	1.40	1.25
June	83	77	.97	.95	1.50	1.40
July	76	75	.95	.95	1.50	1.40
August	76	76	.95	.90	1.45	1.38
September	77	76	.92	.90	1.60	1.45
October	82	77	.95	.92	1.65	1.60
November	86	83	.98	.96	1.70	1.65
December	95	90	1.15	1.05	1.70	1.60

SESAME OIL.

The sesame seed has been unobtainable for practically the entire year. The sesame oil market was exceptionally poor for the period under review, more so than it had been for the last two or three years. Almost every refiner dropped out of the market, owing to the great scarcity of the seed.

SOYA BEAN OIL.

The soya bean oil production in this country during the period has been far greater than that of 1916. The importation of the seed for 1917 amounted to approximately 150,000 bushels. During the former year the record was about 250,000 bushels, which was the largest in the history of the trade. In 1915 the total amount of imports were only 50,000 bushels.

Advices from Leone Korea give the official forecast of the soya bean oil crop, issued by the Governor-General of Chosen, as 16,548,754 bushels up to October, 1917, in comparison with 16,251,879 bushels for the previous year. Exports from China to the United States for the period under review were approximately 500 per cent. less than those of 1916.

Practically all of the oil imported came from Manchuria. Soya bean oil met with a fairly good inquiry throughout the year, and business was running along smoothly, when towards the close the Japanese Government placed restrictions upon Japanese ships. This greatly affected the bean oil trade, and as a result charter rates began to rise. However, these restrictions do not have any effect upon the local market in this country, as enormous crops are grown increasingly in the South. More than 200,000 acres were planted to soya beans there last year. Owing to the decrease in the production of linseed oil, paint makers are steadily turning their attention towards soya oil as a substitute. On account of sellers' high views of the market for cottonseed oil, soya oil is more and more used as a substitute in the making of oleomargarine. For the last quarter of the period, as well as at the present time, this commodity was used in places where both cottonseed and linseed oils have acted as principal factors. The imports for sova bean oil for the fiscal year ending June amounted to 17,392,457 pounds, as against 24,611,383 pounds for the corresponding period a year ago. North Carolina claims rank as the largest soya bean producing State in the country, with an estimated crop for 1917 of 1,500,000 bushels, an increase of 20 per cent. over 1916.

The year opened with soya bean oil quoted in the New York market, spot delivery, at 12@12¼c. per pound in barrels. In February, 13c. was the new level, and in June, 15c. per pound was quoted. On July 1, the coming of summer brought about a drop of ½c. in price. In the fall, business picked up again, and the market for September rose to 14¾@15c. per pound. On October 1, 15@16c. was quoted, and on December 30, 17¼@17¾c. per pound was the best available figure. The price fluctuation for 1917 covered a range of 6¼c. per pound, the low being 11½c. and the high, 17¾c. per pound.

High and Low in New York.

Following are the high and low prices for soya bean oil (in barrels) which obtained in the New York market during each month for the past three years:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	5¾	5½	8¼	7¾	12¼	12
February	6½	5¾	8¾	8½	13	11¾
March	6¾	6¾	9½	8¾	13½	13
April	6¾	6¾	9¼	9	14	13½
May	6½	6½	9¼	8¾	14¾	13¾
June	6¼	6¼	8¾	7¾	15	14½
July	6¼	6	7¾	7¼	14¼	13
August	6	5¾	7¾	7½	14¾	12¾
September	6	6¾	8½	7¾	15	14¾
October	7	6	10½	9	16	15
November	7¾	7	11¾	10½	17½	15¾
December	7¾	7½	12	11½	17¾	17¼
Year	7¾	5¾	13	7¼	17¾	11½

Chicago Soya Bean Oil Market.

The question of bottoms was the principal factor in the soya bean oil market during 1917. Not only was transportation from the Orient very poor and expensive, but labor conditions on the other side of the Pacific were not at all conducive towards a large crop of the bean, nor to very heavy production of oil. Manchuria especially saw much labor unrest.

The immediate effect of the crippled ocean service was the inability of several of the big sellers to fulfill their contracts. Subsequently these men became buyers in the American market and, of course, prices shot upwards at a great pace.

In America the growing use of the hydrogenation process created a strong demand for soya bean oil as a substitute for oleo-stearine in the manufacture of lard compound. The soapmakers, also, took to soya bean oil more readily during the last year than ever before because of the high prices of many other fats.

Soya bean oil during the last year was also a rather popular substitute for linseed oil in varnishes. The hydrogenation process which enabled manufacturers to harden this oil was developed to such an extent that the uses of soya oil both for edible and non-edible purposes were almost unlimited.

Prices of this oil gained 60 to 75 per cent. within the year, being quoted early in the year around 10c. per pound f. o. b. Pacific coast and toward the close of the year at around 16@17c. a pound, coast. As an incident of the railroad congestion, the extreme shortage of cars and persistent storm conditions toward the close of 1917 sellers' tanks commanded a high premium.

CHINA WOOD OIL.

There were unusual developments in the trade, during the year just closed, the principal one being the establishment of record prices, the advance carrying them to a level nearly 100 per cent. above those prevailing at the opening of the year. Imports from China were on a moderate scale, but the demand was keen and bids were advanced to meet this inquiry. Car congestion made deliveries uncertain, and finally shippers were unable to obtain cars sufficient to relieve the pressure here. Hardly any attempt was made to import oil by steamer direct from primary centers, tonnage being so scarce that vessels could not be spared for such long hauls. Consequently most of the imports arrived at the Pacific Coast, and shippers had to depend upon rail transportation. In January, sales were made at 11¾@13¾c. per pound, compared with 9@11c. per pound paid during the same month in 1916, and 6¼@6½c. in 1915. There was a steady advance in prices as the supply decreased, the gain becoming sharp during the summer and fall months, with a high, reached in October, of 23c. per pound, a slight reaction following later on with December finding buyers and sellers operating at from 19..@22c. per pound. The primary markets advanced in proportion, and sellers finally were unwilling to offer in any volume, for better prices were available at home. Furthermore the risk of shipments, trouble in securing steamer space, difficulties of obtaining licenses, not to mention the erratic changes in the rate of exchange and the sharp fluctuatons in silver, the basis of trading, were all factors done away with. When prices began to strengthen, soon after the outbrook of the war, there was some mixing of the better grades of China wood oil with the poorer qualities of vegetable oils, and the past year saw some increase in this operation. This accounted for the rather wide range of quotations, sales being made at times at a difference of 2 to 3 cents a pound, business depending entirely upon the quality of the oil.

Spot Prices for China Wood Oil.

	1915.	1916.	1917.
January	6¼@6½	9 @11	11¾@13¼
February	6¼@6¾	10¾@14	13¼@15
March	6¼@7	13 @14	13 @15
April	6¼@6¾	14 @15	14¼@15
May	6½@6¼	14 @14¼	14¼@16
June	7 @7½	12 @14	16 @16¾
July	6¾@7¼	11½@12½	16¼@19
August	6¾@7¼	10½@11½	17 @20
September	6¾@7½	10¼@12	19¼@22
October	6¾@7½	11¾@12	21 @23
November	7 @8¼	11¾@12	22 @23
December	8¼@9¼	12 @12½	19½@23

HULL VEGETABLE OIL REVIEW, 1917.

General Decrease in Imports During Year Reaches Climax in Government Control After January, 1918.

Hull, England, Jan. 25, 1918.

The government control of the vegetable oil industry in Great Britain has been further extended since last report by the issue of additional orders by the Food Controller, by which he has requisitioned every kind of vegetable oil, with the addition of oleine (distilled), stearine (distilled), neutral lard, vegetable tallow, oleo oil, stearine (beef and mutton), premier gus, and imported tallow. As I write, a further order has been promulgated requisitioning the whole of the margarine products of the country from January 26, the effect being as in the case of seeds and oils, to give the controller full power to control in every particular distribution to the consumer.

Business Suspended.

All business in the ordinary accepted sense of the term in oils, etc., is now suspended—come to a full stop—and dealings can only be done through local committees set up at Hull, Liverpool and other producing centres. Retailers and consumers have to send in their demands to these committees who determine the quantity that may be permitted to each applicant, prices being regulated according to the official schedule.

The chief interest, therefore, centres in production and supplies. The first arrivals of the new Egyptian cotton crop have been received by the mills, and pretty constant supplies are expected onward from now. Fair supplies of oil nuts and kernels are also coming to hand. The estimated production of vegetable oils in the oil mills of Great Britain in December amounted to 20,000 tons, about equally divided between seed oils and nut oils. The total is, however, 9,000 tons behind that of December, 1916, but exports now being much reduced the difference is not so large as it seems.

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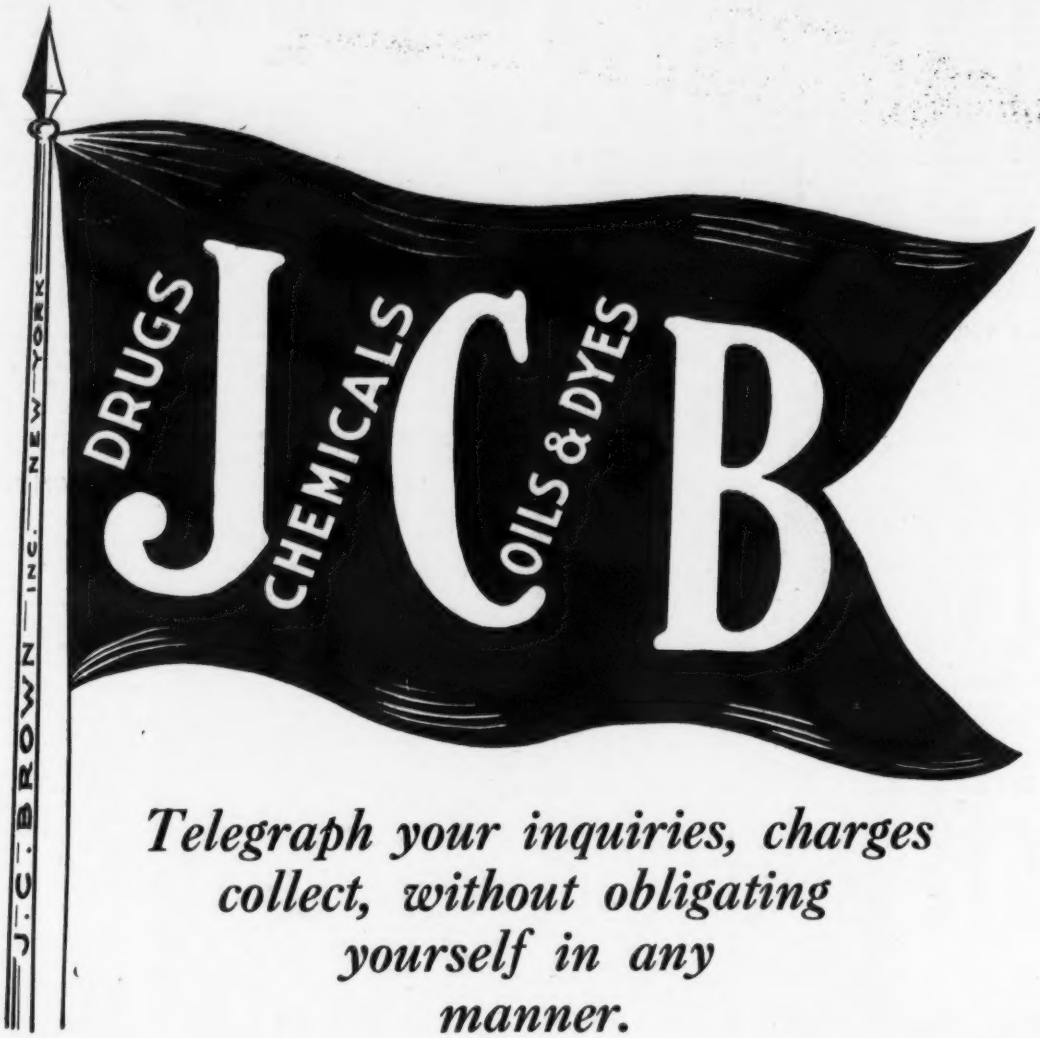

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Caustic Soda
Caustic Potash
Chloride of Lime
Carbolic Acid, U.S.P. (*Phenol*)
Cocaine
Codeine
Chrome Alum Potash
Cocoanut Oil
Epsom Salt, U.S.P.
Epsom Salt, Technical
Hematine
Japan Wax
Logwood
Morphine Sulphate
Menthol
Naphthaline Flake & Ball
Olive Oil
Oxalic Acid
Permanganate of Potash
Quinine Sulphate
Resorcin, U.S.P.
Resorcin, Technical
Rochelle Salts
Red Oil
Saccharine
Salicylic Acid, U.S.P.
Sulphate of Copper (*Blue Vitriol*)
Soda Ash
Sodium Salicylate, U.S.P.
Veronal
Yellow Prussiate of Soda

Cubic Measurements

We have carefully compiled a booklet which contains considerable data pertaining to gross, tare, net weights and cubic measurements of the containers of various chemicals, oils, drugs, dyes, etc. comprehensively arranged.

A line from you stating how many copies of this booklet you require, will bring same to you by return mail, all charges prepaid.

Big Import Decrease.

The preliminary government returns relating to the imports of oil seeds and oil nuts during the year 1917 are now available, and summarized they show that the gross imports of oil seeds only were 567,000 tons, or, after deducting re-exports, 542,000 tons, which is 420,000 tons below the 1916 total. The falling off was principally due to the decreased imports of linseed, very little of this article being received from America. The import from all sources was only just over a million quarters, on two-fifths of the 1916 import, and one-half that of 1915. A new record was, however established in the imports of oil nuts and kernels with a net arrival (after deducting re-exports) of 421,360 tons, against 327,371 tons in 1916 and 339,660 tons in 1915, the previous highest import. Prior to the war the net import of oil nuts and kernels into Great Britain was only about 50,000 tons, so that in four years this branch of the seed crushing industry has multiplied eightfold.

The gross imports of oil seeds and oil nuts in 1917 were 1,014,113 tons and the net, 962,526 tons, and the declared value on landing $130,000,000 (£26,212,524). The 1916 figures were:—Gross imports, 1,393,642 tons, net 1,299,592 tons, and value about the same (£26,293,921).

Calculations based on the above figures show that the estimated production of vegetable oils in the United Kingdom in the past year, with the corresponding figures for 1916, to be as follows:—

	Tons of 2,240 lbs. 1917.	1916.
Seed oils	142,000	253,800
Nut oils	189,940	151,600
Totals	331,940	405,425

Exports of oils (manufacture of the United Kingdom):—

	Tons of 2,240 lbs. 1917.	1916.
Seed oils (unrefined)	47,380	38,163
Nut oils (ref. and unref.)	30,881	9,823
Totals	78,270	47,986
Oilseed cake	85	5,552

Imported Oils.

With regard to the trade in imported oils, the following shows the quantity received and the proportion re-exported to foreign countries:—

	Tons of 2,240 lbs. 1917.	1916.
Imports of all kinds of vegetable oils (refined and unrefined)	111,486	145,854
Re-exports of same	36,340	20,181
Balance remaining in United Kingdom	75,146	125,673
Net imports of oilseed cake (unsweetened)—		
Cotton	131,898	191,905
Linseed	76,860	74,414
Rape	616	734
Other sorts	3,578	16,842
Totals	212,892	283,895

The oil seed cake imports are, however, only half of what they were in 1915, when the total net importation was 418,161 tons.

The government is equipping two factories for the production of margarine, and it is officially stated that very soon the output from these and privately owned factories will be at least 4,000 tons per week. Hitherto England has relied to a very large extent upon Holland for its supplies of margarine, but a great effort is now being made to render England self-reliant for the supplies of this comestible.

NEW YORK MARKET.

ANIMAL AND FISH OIL PRICES TOUCHED NEW HIGH LEVELS DURING YEAR 1917

Many Grades and Varieties Hard Hit by Unusual Demand, Combined With Decreased Output.

COD OIL.

Average prices for the Newfoundland grade of cod oil were the highest attained in recent years, due chiefly to the scanty supplies throughout the period. The sharp advance in values resulted mainly from the war conditions, together with stringent regulations placed by the government upon all shipments of the oil from Newfoundland. These conditions affected the industry to such an extent that the highest figure on record was no great surprise to even the smallest buyer of the trade. Quite a few contracts were put out at the opening of the period at 80@82c. per gallon, but as stocks began to decrease leading refiners were compelled to drop out of the market. In 1916 the production of tanked oil was estimated at approximately 10,000 barrels, and authorities placed the 1917 output at less than 8,000 barrels. The imports of cod oil for the fiscal year ending June were 108,557,874 gallons, valued at $1,568,694, in comparison with 185,549,992 gallons, valued at $2,206,080, for the same period of the previous year.

The year opened with prices in the neighborhood of 80@82c. per gallon. In June quotations took a high position at 84@90c. per gallon. However, at this stage of the twelve months business was at its best, with the highest number of sales recorded. But this bullish situation soon drew to a close, and at the beginning of August supplies were becoming very scarce. The trend of values, from August to October showed an upward tendency, and on October 1 the quotation for this commodity was 90@94c. At the close of the year 96c.@$1.04 per gallon was the best available figure. Price fluctuations for the period under review covered a range of 26c. per gallon, $1.04 recorded as the high, and 78c. as the low.

High and Low in New York.

The following table shows the high and low prices of Newfoundland cod oil in the New York market for each month during 1915, 1916 and 1917:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	37	36	64	62	82	80
February	40	37	62	62	82	78
March	45	40	62	62	80	78
April	45	44	63	62	90	80
May	47	44	62	62	85	80
June	50	47	60	60	90	84
July	50	48	60	58	90	88
August	48	45	62	58½	90	86
September	45½	45	65	64	92	86
October	50	45½	76	68	94	90
November	60	50	78	76	1.05	92
December	62	60	80	78	1.04	96

DEGRAS.

The trend of values in the local market for the English grade of degras was upward throughout the year. Production in the United States was considered very small, and prices were the highest on record. Exports from England were of no account; however, the production there was far greater than it was in this country. According to authorities, it was stated that the total imports for 1917 were almost 150 per cent. less than for the previous year. The feature of the market for the period was the continued scarcity of supplies, which was the cause of the unprecedented rise in prices. The year opened with English brown grade of degras quoted at 7½c. per pound. On July 1 the high level of 10c. was reached, and on December 30 22c., the highest price in recent years, was paid. For the last quarter of the year degras was barely obtainable, very few pressers were offering on the market, and business was practically at a standstill.

High and Low in New York.

The high and low price per pound for English degras in each month of 1915, 1916 and 1917 follows:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	5	4¾	7	6¾	7½	7
February	5¾	5	7½	6¾	8	7½
March	6½	5¾	7½	7¼	9	8¼
April	7¼	6¾	8	7¾	9	8½
May	6¾	6½	8	7¾	9¾	9
June	6½	6	8	7¼	10	9½
July	6¼	6	7	6½	10	9
August	6¼	6	6¾	6½	9¾	9
September	6½	6¼	7	6¼	10	9½
October	6½	6¼	7	6½	11¼	10¼
November	6½	6½	7	7	14¾	11¼
December	6½	6½	7	7	22	16½

HERRING OIL.

The herring oil market was at a standstill for the entire period of 1917, the catch in the Chesapeake Bay being a complete failure. There was very little, if any, oil produced, and no prices were quoted, as refiners were out of the market entirely.

LARD OIL.

The market showed an upward tendency throughout the year. Prices were highest in the history of the trade, as stocks were exceedingly limited for a good part of the period. Demand was fairly active for the first eight months, but as the year drew to a close offerings were lighter as prices advanced. In the Chicago market lard sold at 22c. and over. A compilation by the Chicago Board of Trade shows that lard receipts at Chicago for the year 1917 totaled 105,800,000 pounds and that shipments aggregated 264,700,000 pounds. The most attention was given to the prime grade during the period. Prime lard oil opened the year at $1.30 to $1.40 per gallon. The trend of values continued upward, and in July sellers were asking $1.95 per gallon. By October $2.10 was considered the best available figure. The highest price ($2.45) was seen in November, when spot stocks were practically cleared off the market. On December 30 $2.35 per gallon was the inside price.

High and Low in New York.

The following table shows the high and low prices for prime lard oil in the New York market for each month since January, 1915, and also the high and low prices touched in each year:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	92	92	94	92	1.40	1.30
February	92	92	95	94	1.50	1.25
March	92	90	96	95	1.60	1.40
April	90	88	98	96	1.80	1.58
May	88	86	1.06	1.00	1.90	1.80
June	90	88	1.08	1.04	1.95	1.90
July	88	86	1.10	1.05	1.90	1.86
August	86	84	1.10	1.05	1.90	1.86
September	86	84	1.10	1.08	2.10	1.89
October	90	88	1.25	1.10	2.10	2.00
November	92	90	*1.30	1.25	2.45	2.00
December	92	92	*1.30	1.30	2.35	2.25
Year	92	84	1.30	92	2.45	1.25

MENHADEN OIL.

The season for menhaden oil for the period under review was termed by leading refiners as the most unsuccessful in two years. The amount of the oil produced in 1917 aggregated approximately 73,273 barrels, in comparison with 77,100 barrels in 1916 and 55,000 in 1915. The season was said to be close to a failure with a decrease in production of 3,827 barrels from that of the previous year. Several fishing companies laid up their steamers earlier than usual on account of fleets constantly running into schools of unusually small fish, thus making further operations unprofitable. The commandeering of steamers by the government naturally affected the catches. The largest production of this oil in nine years was reported in 1912, when the total output was estimated at 146,000 barrels. The second largest production in nine years was recorded in 1915, aggregating 86,000 barrels. The output of 1912 exceeded that of 1917 by more than 150 per cent.

Nine Years' Production.

The production of crude menhaden oil in the plants operating along the Atlantic coast and the Gulf of Mexico for 1917 and for the preceding eight years is given in the following tabulation:—

Production for Nine Years.

1917	73,273
1916	77,100
1915	55,000
1914	71,000
1913	96,600
1912	146,000
1911	78,500
1910	77,000
1909	66,000

During the fall, as well as the summer months, the menhaden fish catch was so unsuccessful and the oil stocks so scarce that most of the operators in North Carolina and other Southern districts closed their factories, while local refiners dropped out of the New York market. Southern fishing reports were also bearish, and from the beginning of July to the end of October practically no activity was displayed in the menhaden fish industry.

Wide Price Fluctuations.

Prices for the crude Southern commodity were the highest in the history of the trade, due principally to the poor condition which prevailed throughout the year. The price fluctuation for the period covered a range of 24½c. per gallon, 90c. being the high figure and 65½c. the low. The year opened with 68@70c. quoted for the first quarter, with a very active inquiry recorded. In July the high figure of 73@75c. per gallon was reached. In August the activities of the market were dulled by the coming of the summer and prices fell to a lower level, 70c. being quoted. On December 30 the record high prices were reached, with practically only 3,000 barrels of the crude product available in the South; 85@90c. per gallon was the inside figure.

Light Strained.

For the light strained menhaden oil high prices and a firm level prevailed. Prices for this commodity opened the year with 77@80c. per gallon and in June advanced to 84@92c. Business slackened, as usual during the summer season, quotations ranging at 82@90c. per gallon for August. In October high prices for the light strained grade sympathized with those of the crude, reaching the sharp advance of 93@96c. per gallon. By December 30 offerings were very light and prices for this commodity were the highest on record, at 95@99c. per gallon. The high for the light strained menhaden oil for the year was 99c. and the low 77c. per gallon.

High and Low, Crude Southern.

The high and low prices of crude Southern menhaden oil, in barrels, f. o. b. factory, for 1915, 1916 and 1917, by months, follow:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	35	35	46	46	70	68
February	35	35	47	46	70	65¾
March	35	33	*47	47	70	68
April	*35	35	*48	47	75	70
May	*35	35	*48	48	75	70
June	35	33	48½	48	..	..
July	33	33	48	48	75	73
August	33	33	49½	47½	70	70
September	38	33	48½	47	85	75
October	42	38	60	50	85	85
November	47	43	65	60	85	85
December	47	46	*70	65	90	85

* Nominal.

High and Low, Crude Northern.

The high and low prices of crude Northern menhaden oil, in barrels, f. o. b. factory, by months, for 1915, 1916 and 1917, follow:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	*37	37	†..	..	..	..
February	*37	37	†..	..	..	..
March	*37	37	†..	..	..	..
April	*37	37	†..	..	..	..
May	37	37	†..	..	..	..
June	37	35	53	50	..	..
July	35	35	50	50	..	..
August	35	35	*51½	51	..	..
September	39	35½	†..	..	..	..
October	†..	..	†..	..	..	..
November	†..	..	†..	..	..	..
December	†..	..	†..	..	..	..

* Nominal. † None offering.

High and Low, Light Strained.

The following table shows the highest and lowest prices of light strained menhaden oil in the New York market each month since January, 1914, and also the highest and lowest prices touched each year, the figures being based on the closing quotation each successive week:—

	1914. H.	1914. L.	1915. H.	1915. L.	1916. H.	1916. L.	1917. H.	1917. L.
January	40	39	38	38	54	52	80	77
February	39	39	40	38	56	54	78	77
March	39	39	40	40	56	56	79	77
April	39	38	42	40	58	56	82	77
May	38	38	40	40	61	60	84	82
June	38	38	38	38	60	58	92	84
July	38	36	40	38	57	57	92	88
August	38	37	40	38	57	57	90	82
September	37	37	42	40	58	57	92	84
October	37	37	44	42	66	58	96	93
November	37	37	49	45	72	68	96	94
December	38	38	50	49	79	74	99	95
Year	40	36	50	38	79	52	99	77

RED OIL.

There was an active inquiry for the elaine grade throughout 1917. The high cost of raw materials caused both grades to reach a very sharp advance. Prices moved upward, closing the period at the highest point in recent years. Toward the close most refiners dropped out of the market and very few were quoting on this commodity. The year opened with saponified red oil quoted at 9@10c. per pound. The scarcity and high price of raw material resulted in higher views to 17c. in June. Trading became slack during the summer months and prices dropped to 15c. per pound, continuing so until the fall, when the market again showed an upward tendency, and on December 30 15¾c. was the best available quotation. The high for 1917 was 15¾c. per pound, and the low 8¾c.

High and Low, New York.

Following are the high and low prices (per pound) for saponified red oil, by months, during 1915, 1916 and 1917:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	6¾	6¾	6¾	6¾	10	9
February	6¾	6¾	7½	7	10	8¾
March	6¾	6½	8¾	8	10¼	9¼
April	6½	6¾	9¼	8¾	12	10¾
May	6¾	6	9¾	9¼	15	12
June	6	5¾	9¼	9	17	14½
July	5¾	5¾	9	8½	15	14¼
August	5¾	5½	8½	8¼	15	14¼
September	5½	5½	8½	8	15	14½
October	6½	5½	9	8¾	15	14¼
November	6½	6	9¼	9	15¼	14½
December	6	5¾	9¼	9	15¾	8¾

SEAL OIL.

There was absolutely no seal oil obtainable during the 1917 period, and soap makers, who had always contracted large quantities of this commodity in recent years, were compelled to turn their attention to the whale oil market. The total production in the Newfoundland district aggregated approximately only 1,000 barrels, a decline of 1,500 per cent. from that of the previous year.

SPERM OIL.

Quotations for this commodity in the New York market were steadily advancing throughout the year. As in all the animal and fish oils, prices in 1917 were the highest on record. Business was fairly active for the first eight months, but toward the close very little interest was shown, due to the high views of sellers. The price fluctuations covered a range of $1 per gallon, $1.92 being the high and 92c. the low. In January, 1917, prices for the natural winter, 45 degrees cold test, was quoted at $1.03, with a fairly active inquiry. Prices immediately displayed an upward movement, and sellers' views were as high as $1.28 in June. Unlike the other commodities, the summer months had no effect upon trading, and prices advanced to $1.38 per gallon for July and to $1.45 for August and September. In October offerings of the natural winter oil were moderate, $1.62 being the best quotation. The oil was barely available in December, and at the close of the year as high as $1.92 per gallon was asked, which was an advance of almost 100 per cent. compared with the close of last year.

High and Low, New York.

The following tabulation shows the high and low price for refined sperm oil (natural winter 45-degree cold test) for each month in 1915, 1916 and 1917:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	65	65	72	72	1.03	92
February	65	65	74	74	1.03	98
March	65	65	74	74	1.06	1.02
April	65	65	76	74	1.09	1.05
May	65	65	78	76	1.13	1.09
June	65	65	78	78	1.28	1.11
July	65	65	78	78	1.38	1.27
August	65	65	78	78	1.45	1.37
September	65	65	78	78	1.45	1.44
October	65	65	78	78	1.62	1.52
November	67	65	84	78	1.65	1.60
December	67	67	98	88	1.92	1.79
Year	67	65	98	72	1.92	92

STEARIC ACID.

Like all the oils, prices for the three grades of stearic acid were the highest on record. There was a fairly active demand for the No. 1, or the double-pressed, grade of this commodity for the first half of the period from both foreign and domestic trade. The market was strong during the entire year, with prices reaching a very sharp advance. Influenced by the high cost of raw material, the movement of the market displayed an upward tendency throughout. The double-pressed grade of stearic acid opened the year at 14½@15c. per pound. Raw material became more scarce, thus causing a rise in prices, and in June 26c. per pound was quoted. The summer months had no effect upon the local market. High prices continued until September, when 27c., the highest level in the history of the trade, was reached. On December 30 24½c. per pound was considered the inside figure. Price fluctuations for the period covered a range of 12½c. per pound—27c. for the high and 14½c. for the low.

High and Low, New York.

Following are the high and low prices, per pound, of No. 1, or double-pressed, stearic acid, by months, during 1915, 1916 and 1917:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
January	9¾	9¾	14½	14	15	14½
February	10½	10	14¾	14½	16	14½
March	11	10¾	14½	14	16¼	15
April	12	11	14	14	17½	16¼
May	12	11¾	14	13¾	18	24½
June	12	12	13½	13½	26	24
July	12	12	13½	12½	25	23½
August	12½	12	12	11½	26	23½
September	12½	12½	12¼	11½	27	24
October	13½	12½	13¾	13	26	23
November	14	13½	14½	14¼	24½	22½
December	14	14	15	14¾	24½	24

TALLOW OIL.

Production of tallow oil was light and offerings were moderate throughout the year. Trading was transacted on a fairly nominal basis for the first three months, but for the second half of the period raw material was very scarce and prices advanced more than 30 per cent. In January

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acidless tallow oil was quoted in the New York market at $1.04@1.06 per gallon. This figure was the lowest level of 1917. Prices began to advance, reaching 1.50@1.55 per gallon in June, and $1.57@1.60 by November. As most refiners were out of the market at the close of the year, the highest figure of $1.58@1.60 per gallon was quoted. Price fluctuations for the period under review covered a range of 56c. per gallon, $1.60 being the high and $1.04 per gallon the low.

High and Low, New York.

The following table shows the high and low price for acidless tallow oil for each month in 1915, 1916 and 1917:—

	1915		1916		1917	
	H.	L.	H.	L.	H.	L.
January	62	62	82	76	1.06	1.04
Februa ry ...	62	62	83	82	1.06	1.04
March	62	61	84	84	1.06	1.04
April	62	61	86	84	1.20	1.04
May	62	61	90	86	1.40	1.25
June	61	61	90	90	1.55	1.50
July	62	62	92	88	1.50	1.43
August	63	62	86	82	1.50	1.33
September ..	64	64	90	84	1.50	1.48
October	70	64	95	90	1.60	1.48
November ..	72	70	1.06	95	1.60	1.57
December ..	74	72	1.04	1.04	1.60	1.58
Year	74	61	1.06	76	1.60	1.04

WHALE OIL.

Owing to conditions abroad, the trading in whale oil for 1917 was far below normal. The market was strong and prices advanced sharply throughout the year. Business for the first eight months was transacted in a hand-to-mouth manner, as supplies were steadily becoming meager. For the last quarter of the period spot stocks were positively unavailable, and most of the leading refiners dropped out of the market. Toward the close there was a small amount of crude oil reported to be available on the Western coast, but at such extravagant prices that the Eastern buyers were not offering. Refined oil was also cleared from the Eastern market. The year opened with the natural winter refined whale oil quoted at 77@81c. per gallon. During the summer months, in spite of the usual abatement of trading, sellers' views were as high as 95@96c. per gallon. In the fall supplies were so meager that refiners were not offering on the market and prices reached a very sharp advance. On December 30 $1.25 per gallon was the best available figure for the natural winter. The low for the year was 77c. and the high $1.25 per gallon, a fluctuation covering a range of 48c.

High and Low, New York.

The following tabulation gives the high and low prices of refined (natural winter pressed) whale oil by months during 1915, 1916 and 1917:—

	1915		1916		1917	
	H.	L.	H.	L.	H.	L.
January	48	48	56	54	81	77
February ..	48	48	58	58	80	79
March	48	48	60	58	81	79
April	48	46	60	58	81	80
May	46	46	60	60	87	83
June	48	48	62	60	94	87
July	48	48	63	62	96	93
August	50	48	62	62	96	95
September ..	50	50	64	62	1.00	95
October	50	50	68	64	1.12	1.10
November...	52	50	74	70	1.20	1.10
December ..	52	52	78	76	1.25	1.20
Year	52	46	78	54	1.25	77

HIGHEST PRICE EVER PAID FOR LARD IN THIS COUNTRY WAS RECORDED IN CHICAGO

Month by Month Quotation Was from 60 to 80 Per Cent. Higher Than During Preceding Year.

The year 1917 will be remembered in the Chicago lard market as one in which the prices paid for lard were the highest in the history of the country, in which the demand both foreign and domestic was the strongest ever known and in which the supplies both of the finished product and the raw material—hogs—were dangerously low.

The lowest price at which lard was sold during 1917 was $15.10 per 100 pounds in January and the highest was $28.20 in November. Compared to 1916, month for month, the price of lard last year was 60 to 80 per cent. higher than the preceding year.

Probably the most potent factor in bringing about the demand which resulted in these prices was the extreme scarcity of livestock in Europe. It is the understanding among the best informed lard men here that because of the prevailing high prices of rough feedstuffs, the difficulty of oceanic transportation and the extreme shortage of all animal feeds in Europe by far the greater portion of all the livestock in Europe was killed for consumption.

Denmark was practically stripped of her hogs in order that their owners might take advantage of the high prices paid for bacon by Great Britain. When to this condition there is taken into consideration the heavy toll of lard supplies exacted by the German submarines and the heavy requirements of fats necessary to feed the allies' armies, the unprecedented demand for lard from America is easily understood.

Allies as Buyers.

The buyers for the allied governments throughout the year bought lard in preference to all other fats, having come to the conclusion that it was the most stable. That the need for lard on the other side of the Atlantic was most urgent was emphasized by the fact that it was given preference in ocean bottoms even over cottonseed meal, the principal hog foodstuff in Europe.

In the United States, too, the lard situation was not very bright. Because of a combination of war time circumstances the hogs received at the principal slaughtering houses of the Middle West were of very poor quality. This was attributed to a great extent to the poor corn crop which itself was a result of early frosts. Farmers in many sections fed soft corn to hogs and the poor feeding value of spoilt grain was reflected in a light run of livestock. On the other hand, many farmers rushed their hogs to market in an underfed condition, preferring to sell their grain at the high prices rather than feed it to hogs.

High Feed Cost.

Whereas good corn was available in 1916 for less than $1 a bushel, brought from $1.80 to more than $2 a bushel in the latter half of 1917. At the same time hogs were selling around $16 per 100 pounds. It was estimated that in order for the farmer to be able to feed his corn to hogs and make as much money thereby as he would by selling the corn itself, hogs should sell around $19 per 100 pounds. Likewise it was generally estimated in 1916 that 10 bushels of corn if fed to hogs would make 100 pounds of lard, while in 1917, because of the poor quality of the corn, it was commonly believed that it would take 13 bushels of corn to make 100 pounds of lard via the hog-feeding route.

These statements are substantiated by the Board of Trade's figures on the receipts and shipments of lard for the two preceding years. Receipts in 1917 at Chicago were 108,460,000 pounds, compared to 120,915,000 pounds in 1916. Shipments from Chicago in 1917 were 262,849,000 pounds, compared to 366,813,000 in 1916. The falling off in receipts within the year was approximately 12,500,000 pounds, and the decrease in shipments was more than 100,000,000 pounds.

American Demand Better.

The American demand for lard was better than it had been in years, consumption apparently having been stimulated rather than decreased through the prevailing high prces of everything. The reason for this was the fact that prosperity was more general. The South, especially, paid good prices for lard.

Another big factor in reducing the supply of lard was the fact that the allied governments, through their purchasing agents here, required that certain fats, which heretofore had gone into the lard kettle, be retained on certain cuts of meat shipped overseas. A similar influence was the fact that fat backs which in former years had been converted into lard this year sold at a premium to exporters.

In view of these conditions there is no doubt that the present high prices of lard are insignificant compared to what might have been the case were there no governmental restriction on trading. As soon as the United States entered the war the government began taking actions looking toward the stimulation of lard production, but at the same time fluctuations in the prices of lard were limited to half a cent a day. This has had a remarkable effect in holding the market in check.

In 1917 a smaller proportion of lard was placed in tierces than in previous years, while loose or tank lots were increased. Leaf lard was offered freely during the greater part of the year and was readily accepted by neutral and butterine manufacturers.

Production 190,000,000 Pounds.

With an estimated production of 190,000,000 pounds of lard during the year 1917 Chicago retains the distinction of producing more of the commodity than the rest of the country combined. It is estimated by the best informed persons at Chicago that the aggregate of hog products turned out in 1917 was 950,000,000 pounds compared to 1,215,000,000 in 1916. The aggregate of 6,200,000 hogs slaughtered during the year represented a decrease of 1,900,000 over the preceding year. Prices of hogs advanced materially, breaking all previous records. Beginning with $9.60 per 100 pounds in January they sold up to $20 in August, but later receded about $4.

High and Low Prices, 1916-1917.

The following table gives the high and low prices for cash lard during 1917 and the high and low prices of 1916:—

	1917		1916	
	High.	Low.	High.	Low.
January	16.40	15.10	10.92½	9.87½
February ...	18.45	15.72½	10.30	9.75
March	20.30	18.45	11.42½	10.30
April	21.97½	20.27½	12.77½	11.20
May	22.77½	21.05	13.15	12.50
June	21.67½	20.70	13.20	12.22½
July	21.20	20.15	13.32½	12.57½
August	23.62½	20.90	14.25	12.55
September ..	25.07½	23.37½	14.77½	14.15
October	25.00	22.75	17.00	14.47½
November ..	28.20	25.07½	17.45	16.50
December ...	25.75	23.65	16.85	15.15

Prices of Lard for 52 Years.

The following table shows the lowest and highest cash prices for prime steamed lard in the Chicago market for the last 52 years and the months in which extreme prices were reached:—

Years.	Months the lowest prices were reached.	Yearly range.	Months the highest prices were reached.
1866..December	$11.25	@23.00	May
1867..Jan. & July	11.25	@13.75	August
1868..January	11.75	@19.50	May & Sept.
1869..Oct. & Nov.	16.25	@20.75	February
1870..December	11.00	@17.25	January
1871..Nov. & Dec.	8.37½	@13.00	February
1872..December	7.00	@11.00	July
1873..November	6.50	@ 9.37½	April
1874..January	8.20	@15.50	October
1875..November	11.80	@15.75	Apr. & May
1876..September	9.55	@13.85	Mar. & Apr.
1877..December	7.55	@11.55	January
1878..December	5.32½	@ 7.80	August
1879..August	5.30	@ 7.75	December
1880..June	6.35	@ 7.75	November
1881..February	9.20	@13.00	July
1882..March	10.05	@13.00	October
1883..October	7.15	@12.10	May
1884..December	6.45	@10.00	February
1885..October	5.82½	@ 7.10	Feb. & Apr.
1886..May	5.82½	@ 7.50	September
1887..June & Oct.	6.20	@ 7.92½	December
1888..January	7.25	@11.20	October
1889..December	5.75	@ 7.55	January
1890..December	5.50	@ 6.52½	April
1891..February	6.05½	@ 7.05	September
1892..January	5.47½	@10.00	December
1893..August	6.00	@13.20	March
1894..March	6.45	@ 9.05	September
1895..December	5.15	@ 7.17½	March
1896..July	3.05	@ 5.85	January
1897..June	3.42½	@ 4.90	September
1898..Jan. & Oct.	4.62½	@ 6.82½	May
1899..May & June	4.90	@ 5.77½	January
1900..February	5.65	@ 7.40	October
1901..January	6.90	@10.25	September
1902..February	9.07½	@11.60	September
1903..October	6.20	@11.00	September
1904..May	6.15	@ 7.92½	February
1905..January	6.55	@ 8.10	August
1906..January	7.32½	@ 9.85	November
1907..November	7.50	@ 9.97½	February
1908..February	6.97½	@10.45	October
1909..January	9.40	@13.90	November
1910..November	9.70	@14.65	March
1911..April	7.70	@11.61½	January
1912..February	8.65	@11.97½	October
1913..January	9.47½	@11.87½	July
1914..August	8.60	@11.60	November
1915..July	7.55	@11.27½	February
1916..February	9.75	@17.45	November
1917..January	15.10	@28.50	November

Stocks of "Contract" Lard.

The following table shows the stocks of "contract" lard on hand in Chicago on the first of each month in the years named:—

	*Tcs. 1917.	Tcs. 1916.	Tcs. 1915.	Tcs. 1914.	Tcs. 1913.	Tcs. 1912.
Jan.	77,970	43,900	19,741	38,738	17,325	49,857
Feb	74,400	139,700	18,536	73,231	18,981	82,795
Mar	87,100	184,350	70,543	97,107	16,062	104,959
Apr	71,300	212,500	96,601	105,705	12,534	107,189
May	61,140	202,250	125,580	123,799	13,304	118,059
June	55,700	177,200	195,431	143,059	33,905	120,437
July	94,400	167,800	248,871	160,216	84,781	166,475
Aug	131,000	182,900	274,960	200,574	120,424	194,083
Sep	130,000	144,200	266,913	179,784	125,134	163,857
Oct.	116,000	111,240	240,932	120,921	110,137	91,156
Nov	39,000	87,100	169,751	17,295	64,780	42,702
Dec	41,700	62,300	134,878	11,379	48,523	17,341

* Tierces 350 lbs. each.

Lard for May Delivery.

The figures below represent the range of prices monthly at which lard for May delivery sold, from the first sale to the expiration of the delivery, for the seasons mentioned:—

Months.	1917-18.	1916-17.	1915-16.
June	....	....	....
July	....	....	....
	....	....	....
August	....	....	....
	....	....	....
September	....	....	9.10
	....	....	9.12½
October	....	13.42½	9.02½
	....	15.80	9.90
November	23.62½	15.27½	8.87½
	25.40	16.72½	9.92½
December	23.40	15.50	9.57½
	25.00	16.37½	10.30
January	....	15.35	10.07½
	....	16.75	11.22½
February	....	15.70	10.00
	....	18.47½	10.55
March	....	18.32½	10.42½
	....	20.30	11.60
April	....	19.95	11.20
	....	21.95	12.75
May	....	21.07½	12.45
	....	22.82½	13.15
Entire range	....	13.42½	8.87½
	....	22.82½	13.15
Months.	1914-15.	1913-14	1912-13.
June	....	....	....
	....	....	....
July	....	....	....
	....	....	....
	....	....	....
August	....	10.75	....
	....	10.92½	....
September	....	10.95	10.02½
	....	11.45	10.62½
October	10.00	10.40	10.12½
	10.22½	11.17½	10.75
November	9.82½	10.70	10.10
	10.77½	11.27½	10.37½
December	9.75	10.87½	9.70
	10.75	11.20	10.27½
January	10.62½	10.95	9.70
	11.35	11.40	10.40
February	10.15	10.56	10.15
	11.60	11.20	10.85
March	10.00	10.45	10.47½
	10.82½	10.99	11.22½
April	9.95	9.77½	10.65
	10.35	10.62½	11.25
May	9.47½	9.62½	10.80
	10.32½	10.10	11.30
Entire range	9.47½	9.62½	9.70
	11.60	11.45	11.30

Chicago Tallow Market Showed Poor Yield and Heavy Demand.

As was the case in practically all other packing house products and by-products during 1917 the yield was rather poor and the demand for it was strong throughout the year, with one slight exception. This was one of the few items in the packing house list—perhaps the only one—which experienced any decided, though temporary, halt in the steady upward trend of prices.

Glycerine, formerly a by-product of tallow, this year became its principal product and the course of the glycerine market was to a large degree the key to the tallow market. The high grade tallows, especially, yielding about 10 per cent. glycerine, were in strong demand throughout the year.

However, for a month or so in the latter part of the year the price of linseed oil took a great slump, due principally to the falling off in the paint trade, and soapmakers seized this opportunity of obtaining a cheap substitute for tallow. While tallow was selling around 16 cents a pound at that time—November—linseed oil was available at around 95c. to $1 a gallon, or about 12½c. a pound. Former heavy consumers of tallow for soapmaking purposes bought linseed heavily at these prices.

Generally speaking, however, the Chicago tallow market was strong throughout the year. The price of edible tallow rose from 10c. a pound in January, 1917, to 19c. in December; prime packers' tallow advanced during the same period from 11⅜c. to 18¼c.; No. 1 packers' tallow from 11⅛c. to 18c., and No. 2 packers' tallow from 9⅜c. to 16c. per pound. Early in 1917 tallows were selling at a 25 per cent. advance over the same period of 1916; by the middle of the year this margin was about 50 per cent., and at the close of 1917 nearly all tallows were bringing prices 75 per cent. or more above the list for the corresponding period of 1916.

High and Low Edible Tallow.

The following is the monthly range of prices for edible tallow for the year just closed:—

January	$0.10	@	$0.12½
February	12½	@	13
March	12¾	@	14
April	14	@	17¼
May	17½	@	20
June	17⅝	@	19½
July	15	@	18¼
August	15¼	@	18½
September	18	@	18½
October	18	@	18½
November	18	@	19
December	18	@	19

Chicago Stearine Market.

An extraordinary demand from soap and candle makers kept the white and yellow grease stearine market at Chicago strong throughout the year. Although the record-breaking prices which prevailed during the year was a great stimulant to production, supplies of stearines were never burdensome during 1917 and a strong list of prices was mantained. Early in the year oleo stearine attracted a good premium over tallow, due to the strong demand from compound makers, but later in the year the demand from this source waned somewhat when the new process for hardening or hydrogenating bean oils came into universal use. The substitution of the hydrogenated bean oils for oleo stearine reduced the demand for stearine on the part of compound makers to a minimum.

The elimination of this demand reduced the premium of stearine over tallow from about 2c. to ½c. per pound. Until about July the hydrogenation process was used by only one firm, the Procter & Gamble Company, its patentees. At that time a court decision led other soapmakers to believe that they could use the process and since then hydrogenation plants have been installed by several of the big Chicago companies.

The price of "A" white grease stearine advanced from 11½c. per pound in January to 19½c. in May. In July it dropped to 15¼c. and then climbed back to 18½c. in October and receded a ¼c. in December. Yellow grease stearine followed a similar course, starting the year at 10¼c. per pound and bringing 16½c. in December.

The course of prime oleo stearine was a little more erratic, although the gain at the close of the year was just as great as in the other branches of the stearine market. Starting at 12¼c. a pound in January, oleo stearine climbed to 21½c. in May and then dropped to 16c. in July. In October, however, this commodity attained the record-breaking price of 23c. per pound. At the close of the year trading was on a basis of 18@19c.

High and Low Oleo-Stearine.

The monthly range of prices for the prime oleo-stearine on the Chicago market during the previous year follows:—

January	$0.12½	@	$0.15
February	12¾	@	13
March	13¼	@	15
April	15½	@	19¼
May	19	@	21½
June	18	@	20
July	16	@	18¼
August	16¼	@	19¼
September	19½	@	20½
October	22	@	23
November	21	@	22¼
December	18½	@	19

Chicago Grease Market.

There was a heavy demand for all sorts of greases on the Chicago market throughout the year 1917. Because of the scarcity of supplies, the record-breaking high prices and the uncertain national and international conditions that existed at various periods of the year nearly all buying was done at a hand-to-mouth basis. A great portion of the trade was continually looking forward for some indefinite development—such as governmental regulation, the conclusion of peace, etc.—that might break the course of the market, but their hopes were never realized and all who bought paid the high prices.

Choice low acid greases specially were in good demand and maintained a 1@2c. premium over tallow. These greases were sought principally for the manufacture of lard oils. The prices of grease at the close of 1917 were almost double those of the opening of the year and in many months the figures at which sales were made represented increases of more than 100 per cent. over the prices of the corresponding months of 1916.

Chicago Corn Oil Market Very Strong Over Year.

The corn oil supply and its market were more affected by war conditions and the elements during 1917 than most other of the vegetable or animal oils. Because of the extreme shortage of supplies and a heavy demand from both old and new sources, the corn oil market was very strong throughout the year. July brought a comparative weakening in the market, but even then the prices paid for this commodity were in excess of the highest prices paid at any time in 1916.

A poor corn crop, a shortage of labor, coal and railroad cars and government limitation of distilleries were the principal factors in reducing the available corn oil supply. Early frosts damaged the corn crop; enlistments and the draft made labor scarce; some of the biggest producers of corn oil in the country were compelled to close their plants for weeks at a time because of the lack of coal.

On top of this the government in the fall prohibited the use of grain for the manufacture of alcoholics, an act which shut down a majority of the whiskey plants at Peoria, Ill., the biggest distil-

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lery center in the world and at the same time reduced greatly the production of corn oil. Still later this market was seriously affected by a request from the Food Administration that no corn oil fit for edible purposes be sold for industrial or technical uses.

The development of the hydrogenation process also brought about the use of corn oil as a substitute for many other oils in the manufacture of salad oil and other edible products.

Prices of corn oil gained 70 to 80 per cent. within the year. In January it was sold at 10½@10¾c. per pound, f. o. b. Chicago, loose basis, while in December the quotation was 17½@18c. per pound.

High and Low Prices.

The following table shows the high and low prices attained by corn oil on the Chicago market during each month of the preceding year:—

January	$0.10½@	$0.10¾
February	10½@	11½
March	11¼@	12¼
April	12 @	15
May	14¼@	15
June	13¼@	14¼
July	11 @	12¾
August	12½@	13¾
September	14 @	15
October	16¼@	18
November	17 @	18
December	17½@	18

PROMISE OF 1916 IN PAINT MARKET NOT FULFILLED BECAUSE OF THE WAR

Transportation, High Cost of Basic Materials and Oils, Embargo Regulations and Loss of New Work All Factors in Consumption Loss.

The year 1917 will long be remembered by the paint and varnish industry as being one of the most perplexing and disappointing in the history of the trade. War conditions were predominant and the attention of the consuming trade was diverted to other channels. At the end of 1916 the trade was in fair shape and preparations were being made for an unusual amount of work during the coming spring and summer months. Financially, the country was prosperous and the campaign inaugurated by the paint and varnish manufacturers of the country urging both the public and manufacturing plants to use paint in liberal volume to conserve property met with considerable success. The industry at the beginning of 1917 looked for an exceedingly bright year. Then came the declaration of war by the United States, and the first rush of unsettlement, not only in this trade but business in general. As the spring approached much work previously contemplated was allowed to remain undone, and during the summer and fall only that needing immediate attention was considered. Meanwhile the freight congestion became more and more acute and the embargo restrictions, the tonnage scarcity and then the fuel shortage all united to force a curtailment of production. On top of all came the question of essential and non-essential commodities that would be moved by government order. Legislation at Washington to affect consumption seemed to be aimed directly at the paint trade, for this was not classed as among the essentials. Thus the high hopes entertained at the beginning of the year were quickly dispelled, and when the close of 1917 came business had dwindled to small proportions, so far as the usual channels of consumption were concerned. True, the government was in the market for fair-sized lots of all paints and mixtures, but the volume of this buying during the latter part of the year was not sufficient to offset the loss elsewhere.

Despite this state of affairs there was no weakening of prices, and, in fact, manufacturers were able to receive more for their product than in years gone by. Since the outbreak of the war there has been a steady gain in values, with probably the greatest upturn taking place during the season just ended. This is attributed entirely to the higher cost of raw materials and the scarcity of supplies. It must be remembered that during the seasons of 1915 and 1916 manufacturers did not advance prices of paints in line with advances of producing costs, and there was nothing to do in 1917 but readjust values upon a satisfactory working basis. The difficulty of importing goods became acute as the year advanced. Many qualities were unobtainable. Scarcity of freights and the high rates affected every imported grade. Imports of chalk gradually fell off and prices advanced steadily. At primary centers the production was good, but it could not be exported, freight room being given to other commodities thought more essential to war purposes. Supplies were not anywhere near sufficient to meet the domestic demand and the position of whiting and putty was influenced as a result. Imports of casein fell off also, although the demand at no time either from the paint or paper industries was urgent. Imported pigments were out of the question and no offerings of litharge, English glassmakers', red lead, English glassmakers', white lead, English, in oil, orange mineral, English, French or German barytes and French or Italian talc, appeared on the market and nominal prices ruled. This compelled demand to be dissatisfied with the American product.

A review of conditions would hardly be complete without emphasizing the sharp price movements in lead and the lead pigments. A rise of nearly seven cents a pound took place during the spring and summer months with a subsequent reaction of practically all of this gain during the fall. It was no wonder that consumption of paints suffered, for it is difficult to base future operations on a market moving so rapidly. Lithopone producers, however, had no trouble in disposing of their output. Prices were high in view of the position of the chemical market. Zinc oxide was another commodity well taken, the bulk of this business being done on a contract basis. Domestic barytes met with a better trade, but the trouble lay in making shipments.

The dry color industry made progress and manufacturers were in a position to turn out many grades formerly imported. Prices were higher than previous years due to the strength of many chemicals and the constantly advancing prices of production. Toward the end of the season the industry became strained when the embargo restrictions were enforced in regard to shipments to Northern centers. This prevented many of the essential colors reaching producing plants, such as carbon gas blacks, of which manufacturers of printing inks use enormous quantities. Spot supplies of all colors were reduced and prices started upward. Smaller imports were bound to occur as the shipping space decreased, and it is likely that the coming season will see a decidedly small movement of foreign qualities, providing, of course, the war does not end suddenly with a rapid change in the tonnage situation.

Not only did these miscellaneous materials entering into the manufacture of paints rise rapidly in value, but oils also experienced a sharp upward trend and the available supplies rapidly diminished. While record price levels were established, linseed oil remained the cheapest of any, that trade nevertheless facing the problem of transportation that was so pronounced in every other line. Furthermore the flaxseed crop was a failure in this country and while the Argentine promise was good the question of ships gave little hope that crushers would be able to fill all requirements.

PIG LEAD.

High Prices and Market Fluctuations in 1917.

Seldom in the history of the trade have prices of pig lead fluctuated in such a violent manner. The high price paid the year previous stimulated production, and early in 1917 still higher prices resulted in a greater output. Prices of silver were materially higher and silver-lead mines which had been abandoned years ago were reopened. The first half of the year found conditions exceedingly prosperous, with prices well above normal levels. All this changed in the latter part of the year. Prices fell down sharply, and at the end selling was below quotations prevailing at the opening. The output was not curtailed and the cost of production failed to react with the commodity, so that the cry soon went up that lead was selling below the cost of production. At the outset of the year, lead in New York was selling at 7.5c. per pound, jumping to 10.5c. per pound late in February, holding that price until early in April, when a setback to 9.25c. per pound occurred. From then until June an advance, that carried prices up to 12.25c. per pound, featured operations. This proved to be the high point. Prices reacted, but rallied during August, only to meet severe competition and reselling, with the result that the fall and early winter months found prices declining rapidly, and at the end of the year lead was selling at about 6¼c. per pound, slightly above the low for the year.

Production.

The production of refined lead, desilverized and soft, from domestic and foreign ores in 1917 is estimated at 599,000 tons, worth, at the average New York price, about $110,000,000, compared with 571,134 tons, worth 78,816,000, in 1916, and with 550,055 tons, worth $51,705,000, in 1915. The figures for 1917 do not include an estimated output of 20,000 tons of antimonial lead, worth about $4,600,000, compared with 24,038 tons in 1916 and with 23,224 tons in 1915. The production of desilverized lead of domestic origin, exclusive of desilverized soft lead, is estimated at 297,000 tons, against 316,469 tons in 1916, and 301,564 tons in 1915; and that of desilverized lead of foreign origin at 59,000 tons, compared with 18,906 tons in 1916 and 43,029 tons in 1915. The production of soft lead from Mississippi Valley ore is estimated at 243,000 tons, compared with 235,759 tons in 1916 and 205,462 tons in 1915. The total production of desilverized and soft lead from domestic ores was thus about 540,000 tons, valued at $99,000,000, compared with 562,228 tons, valued at $76,207,000 in 1916, a loss of about 12,000 tons. The loss of nearly 20,000 tons in domestic desilverized lead was partly offset by a gain of 7,000 tons in domestic soft lead and much more than made up by a gain of 40,000 tons in desilverized lead of foreign origin.

Soft Lead.

The final figures for the production of soft lead will show an increase of a few thousand tons over those here given, for the smelters and refiners of argentiferous lead undoubtedly treated some soft lead ore from the Mississippi Valley, which in their preliminary estimates is not distinguished from silver-lead ore.

In consequence of the great demand and high price, about 5,000 tons of secondary antimonial lead were recovered at the regular smelters.

The imports of lead are estimated at 20,000 short tons of lead in ore, valued at $2,200,000; 37,000 tons of lead in base bullion, valued at $5,100,000, and 4,400 tons of refined and old lead, valued at $650,000, a total of 61,400 tons, valued at approximately $8,000,000, compared with 35,330 tons in 1916. Of the imports in 1917 about 48,000 tons came from Mexico, against 25,919 tons in 1916.

Imports—Ten Months.

The lead imported into the United States during the first 10 months of 1917, comprising lead in ore, bullion, and pigs, and old lead, originated as shown in the following table:

Lead imported into the United States, January to October, 1917, in short tons:—

	From Mexico.	From Canada.	From other countries.	Total.
January	2,665	1,762	33	4,460
February	964	292	918	2,174
March	4,534	1,528	94	6,156
April	4,162	515	647	5,324
May	5,680	365	198	6,243
June	4,502	107	1,344	5,953
July	3,653	164	4,381	8,198
August	7,509	1	271	7,781
September	6,285	80	118	6,483
October	2,510	33	386	2,929

Exports.

The exports of lead of foreign origin smelted or refined in the United States showed considerable increase. They are estimated at 17,000 tons, worth $3,300,000, against 9,880 tons in 1916 and 38,618 tons in 1915. These figures do not include the lead in foreign lead manufactures exported with benefit of drawback, which amounted to 3,227 tons in the first half of 1917. For the last four years notable quantities of domestic lead have been exported to Europe, and the total for 1917 is estimated at 48,000 short tons, valued at $8,300,000, compared with 100,565 tons, valued at $13,508,203, in 1916.

Pig Lead Exports.

Pig lead exported from the United States, January to October, 1917, in short tons:—

Month.	Made from domestic ores.	Made from foreign ores.	Foreign lead used in articles exported with benefit of drawback.
January	8,095	641	....
February	3,030	133	....
March	3,744	959	....
April	3,454	2,382	3,227
May	4,197	1,209	....
June	6,621	742	....
July	3,135	90	....
August	1,905	89	....
September	4,346	104	....
October	2,665	10,250	....

Refined Lead Production Since 1900.

The following table shows the production of refined lead, in tons, in the United States, from 1900 to 1917, inclusive:—

	Desilvered.	Soft lead.	Total production.
1900	329,658	48,021	377,679
1901	323,790	57,898	381,688
1902	303,011	74,050	377,061
1903	295,074	83,444	378,518
1904	315,284	89,169	404,453
1905	296,186	103,116	399,302
1906	313,886	90,860	404,746
1907	314,241	99,948	414,189
1908	295,420	101,013	396,433
1909	329,310	118,802	448,112
1910	329,062	141,318	470,380
1911	331,029	155,947	486,976
1912	311,414	169,551	480,965
1913	301,830	156,013	466,843
1914	337,552	199,527	537,079
1915	355,000	210,000	565,000
1916	345,400	234,200	579,600
1917	297,000	243,000	540,000

WHITE LEAD.

Most Erratic Prices Ever Known to Trade.

As far as price movements were concerned, the year was a record one, and probably never in the history of the trade were such erratic price movements witnessed. The demand was not particularly urgent at any time, although the supply on hand was moderate. The sharp upward trend of the basic material and the strength, for a time, of acetic acid forced corroders to curtail production. Then, too, a labor shortage and the difficulties of shipping acted against important trade operations. In the early part of the year prices averaged around 8¾c. per pound, gradually advancing until May, when a level of 10c. per pound was reached. This was bettered during the next three months, and in early August sales were made at 11¼c. per pound, the high price of pig lead being reached also about this time. From then on, the market weakened and prices declined steadily, finally ending at 9@10c. per pound, 2½c. below the high of the season and ¼c. above the opening level. The basic material suffered a sharp break, also, while the placing of an embargo against imports and exports of acetic acid resulted in larger supplies of this commodity. The market became extremely dull toward the end of the year, the only interest displayed, both by the buyer and the seller, being the efforts to make deliveries on contract. The government was expected to step in and take control of the lead industry, stabilize prices, and regulate production so that the average consumer was willing to await the coming of the new year rather than contract ahead.

Basic Sulphate.

Prices for the basic sulphate followed along, to a great extent, with basic carbonate, opening the year at 8¼c. per pound, advancing to 11c. per pound in June and maintaining this figure during the summer months, this quotation eventually proving to be the high of the year. The reaction from then to the end of the year carried prices down to 8½c. per pound.

Basic Carbonate White Lead Prices.

The following table shows the price of dry basic carbonate white lead for each month last year, with comparisons for the former three years:—

	Cents per pound. 1917.
January	8¾@—
February	8¾@—
March	9¼@—
April	9¼@9¾
May	10 @10½
June	10½@11⅛
July	11⅛@—
August	11⅛@—
September	10 @11⅛
October	9 @10
November	9 @—
December	9 @10

	High.	Low.
1917	11⅛	8¾
1916	8¾	6¼
1914	7¾	5
1914	5¼	5

RED LEAD.

Prices fluctuated within a 3¼c. range, this covering from 9¾@13c. per pound. There was an advance and then a decline, with the natural trend following the fluctuations in the basic materials. At the beginning of the year, red lead was quoted at 9¾c. per pound. An advance to 10c. per pound followed in February, 10½c. per pound in March, 11c. per pound in April, 12c. per pound in May, and 13c. per pound in June, this being the high of the season and maintained during July, August and September. A break to 11c. per pound occurred in October, and to 10c. in November, with prices established on this basis at the end of the year. With the scarcity of tonnage, foreign prices ceased to be a factor, for imports were out of the question. There was a fair domestic demand for red lead early in the year, but during the latter months consumption decreased materially. Producing costs were high throughout the season, in fact well above those of previous years. Transportation difficulties, scarcity of labor and the fuel shortage, which became acute toward the end of the year resulted in a demoralized trade.

High and Low Prices Domestic Red Lead.

The subjoined table shows the high and low prices of domestic red lead for last year, with comparisons for the former year:—

	1916 High.	1916 Low.	1917 High.	1917 Low.
January	7¾	7¼	9¾	9¾
February	8¼	7¾	10	9¾
March	9¾	8¼	10½	10½
April	9¾	9¾	11	10½
May	9¾	9¾	12	11½
June	9¾	9¾	13	12
July	9¾	9¾	13	13
August	9¾	9¾	13	13
September	9¾	9¾	13	11
October	9¾	9¾	11	10
November	9¾	9¾	10	10
December	9¾	9¾	10	10
1917			13	9¾
1916			9¾	7¼
1915			9¾	5½
1914			6½	5½
1913			7½	6
1912			7½	6¼

LITHARGE.

This pigment followed to a a great extent the price trend established in other pigments, starting the year strong, reaching the high around the middle of the summer, and then falling back to almost the levels prevailing at the start of the year. The demand in the early season was good consumers of this grade buying on a fairly liberal scale, and the advances in the basic material helped the upturn. Later on there was a change in the situation. The car congestion became acute, shipments were almost impossible, and the threatened embargo against shipments of window glass, an industry which is one of the consumers of this commodity, soon forced prices to a lower level. In the meanwhile the production was fully up to normal, and at all times sufficient to take care of the inquiry. At the beginning of the year, prices were at 9¼c. per pound and advanced from there to 12½c. per pound in June, holding that level until September, when the reaction set in, finally selling in December at 9½c. per pound, 3c. per pound below the high of the year and only ¼c. per pound above the opening quotation.

High and Low Domestic Litharge.

The highest and lowest quotations for domestic litharge on the local market for the last year, with comparison, follow:—

	1916 High.	1916 Low.	1917 High.	1917 Low.
January	7¼	6½	9¼	9¼
February	7¾	7¼	9¼	9¼
March	9¼	7¾	10	9½
April	9¼	9¼	10	10
May	9¼	9¼	11½	10
June	9¼	9¼	12½	11½
July	9¼	9¼	12½	12½
August	9¼	9¼	12½	12½
September	9¼	9¼	12½	10¼
October	9¼	9¼	10½	9½
November	9¼	9¼	9½	9½
December	9¼	9¼	9½	9½
1917			12½	9¼
1916			9¼	6½
1915			9¼	5
1914			6	6
1913			7	6
1912			7	6½

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ORANGE MINERALS.

Price changes for the twelve months were fully as large as other pigments, although not as much interest is displayed in this market as in the others. Foreign grades were removed from the market entirely, receipts being impossible in view of the scarcity of tonnage, but the demand was not increased to any extent. Throughout the year the trade was more or less routine. Operations in the trades which are the principal users of this grade were moderate and war conditions predominated. The beginning of the year found sales being made at 12c. per pound, and gradual advances took place until June, when the high of the year was reached, 15c. being the established basis. This level held until the early part of September, when the market turned easier and prices reacted to 13c. per pound, selling in December at that level.

Two-Year Prices Domestic Orange Mineral.

Prices for domestic orange mineral for each month of the past year, with comparisons for the former year, were as follows:—

	1916		1917	
	Low.	High.	High.	Low.
January	9	10	12	12
February	10	10½	12½	12
March	10½	12¼	12½	12½
April	12	12¼	13	12½
May	12	12¼	14	13½
June	12	12¼	15	14
July	12	12¼	15	15
August	12	12¼	15	15
September	12	12¼	15	13
October	12	12¼	13	13
November	12	12¼	13	13
December	12	12¼	13	13
			High.	Low.
1917			15	12
1916			12¼	9
1915			9¼	7¼
1914			8½	7¼
1913			10	7½
1912			10	8½

SPELTER.

Consumption Within 5 Per Cent. of 1916.

Erratic and sharp price changes were a feature in this market. Starting the year at 9⅝c. per pound, prices advanced to 10c. per pound, reacting early in February to 9.8c., but toward the end of the month worked up to 12⅝c., which eventually proved to be the high of the year. In March fluctuations covered a cent a pound, prices closing at 11½c. per pound. In April the market was weak and sales were made down to 9½c. per pound, this price holding through May and June. Early in July, a further setback occurred and prices continued downward until the early part of November, when 7.62½c. per pound was established. There was a slight rally, but in December the low point of the season was reached, when prices touched 7.50c., finally closing at 7.82½c.

Statistics of the year show that the domestic consumption came within 5 per cent. of the high of 1916. According to trade opinion, consumption was supposed to have decreased at least 10 per cent. and some interests figured the loss as high as 20 per cent. Large quantities of spelter, which appeared in the statistics as apparent consumption, existed in the form of invisible stocks at St. Louis, at the seaboard, and other distributing centers, and were moved away in order to overcome traffic delays and bring the stocks close to places where they would eventually be needed.

Production, 574,994 Short Tons.

The production of spelter from domestic ore in 1917 is estimated at 574,994 short tons, worth, at average St. Louis spot quotation, about $102,350,000, and the production from foreign ore at 92,757 tons, a total of 667,751 tons, worth $118,860,000, compared to a total of 667,456 tons in 1916 (563,561 tons domestic origin, and 104,005 tons of foreign origin), worth $178,878,000 at the average St. Louis selling price. This indicates practically the same production as in 1916, but a loss of more than $60,000,000 in value. Included in the output is 28,175 tons of electrolytic spelter, of which a part was refined by electrolysis from prime Wesern spelter. This was the product of five plants. The quantity of zinc dust prepared for market was over 7,000 tons. The output of secondary spelter redistilled at regular smelters and at the smelters with large retorts was about 21,600 tons.

Primary spelter was produced during the first half of the year at the rate of 722,000 tons a year, during the third quarter at the rate of 628,000 tons a year, and during the fourth quarter at the rate of 600,000 tons a year.

Primary Spelter.

The production of primary spelter from both domestic and foreign ores, apportioned according to the States in which it was smelted, by six-months periods, was as follows:—

	Short tons			
	1916		1917	
State.	First half.	Second half.	First half.	Second half.
Illinois	90,082	90,268	95,149	79,668
Kansas	74,592	65,924	42,359	33,269
Oklahoma	73,298	90,790	109,130	89,389
Other States.	78,480	95,054	114,500	104,287
Totals	316,452	342,036	361,138	306,613
	658,488		667,751	

Imports.

The imports of spelter (mostly scrap, probably) are estimated at 270 short tons, valued at about $25,000, compared with 684 tons in 1916. Zinc dust was imported to the amount of 390 tons, worth $90,000. The imports of zinc ore in 1917 were approximately 215,000 short tons, containing about 75,600 tons of zinc and worth about $4,550,000, compared with 385,964 tons of ore, containing 148,147 tons of zinc, in 1916. The imports of zinc ore in the first 10 months of 1917 originated as follows:—

	Short tons		
From—	Ore.	Zinc content.	Value.
Canada	14,554	4,362	$294,669
Mexico	130,090	41,853	2,574,129
Spain	14,778	6,083	260,922
Italy	5,919	2,411	117,271
French Africa	1,246	623	66,346
Australia	27,731	12,502	753,598
Totals	194,318	67,834	$4,066,935

Exports of Spelter.

Exports of spelter and sheets made from domestic ore are estimated at 144,000 short tons, worth $37,000,000, compared with 163,137 tons, worth $51,312,990, in 1916. Exports of spelter made from foreign ore are estimated at 60,000, valued at $11,900,000, compared with 43,230 tons in 1916. The exports of zinc manufactures fell off to $400,000 in 1917 from $572,286 in 1916. Exports of brass are estimated at 169,000 tons, valued at $104,300,000, compared with 132,466 tons, worth $72,683,626, in 1916. Manufactures of brass were exported to the value of about $134,500,000, compared with $241,668,081 in 1916. The value of loaded cartridges exported in 1917 was about $41,000,000 against $55,103,904 in 1916.

The exports of spelter made from foreign ore and of spelter and zinc sheets made from domestic ore are shown in the following table:—

Exports, Short Tons.

	1916		1917	
Month.	Domestic.	Foreign.	Domestic.	Foreign.
January	10,483	3,531	15,531	2,650
February	10,228	3,919	15,549	4,860
March	8,171	575	17,408	8,230
April	9,133	1,902	12,669	3,248
May	8,583	4,811	19,528	9,946
June	11,309	5,459	13,005	1,757
July	12,709	4,508	8,863	2,240
August	18,662	4,232	11,283	758
September	19,125	965	8,749	19,625
October	19,904	6,110	6,057	2,451
November	18,988	4,260	....	....
December	15,652	2,958	....	....
Totals	163,137	43,230	128,733	55,765

ZINC OXIDE.

Contract prices for the first half of the year on American grades averaged from 9¾c. to 10c. per pound and for the past six months producers named a basis of from 10¼c. to 10½c. per pound. These prices show little change from the levels prevailing the year previous. The demand was good at all times, and large producers continued to follow their policy of selling on contract. Consequently there was not much on the spot at any time and this market was in a more or less nominal position.

French Process Prices.

For the first quarter of the year, contract prices were on the following basis:—17½@17⅝c. for red seal; 18@18⅛c. per pound for green seal, and 18½@18⅝c. for white seal In March, producers named a new schedule of prices for contract, covering the second quarter of the year. These were:—Red seal, 15@15½c. per pound; green seal, 15½@15⅝c. per pound, and 16@16⅛c. per pound for white seal. These prices, to the surprise of the trade, were lower and resulted from the depression in the price of spelter, which broke sharply from the opening levels of the year. Contract prices for the third quarter of the year were named early in June, but they were unchanged from the previous level. Early in September the final contract bases for the year were announced, and these became effective October 1. They were a cent a pound below the previous quotations and were on the following basis:—Red seal, 14@14½c. per pound; green seal, 14½@14⅝c. per pound, and white seal, 15@15½c. per pound. Further declines in spelter, carrying that commodity to the low levels of the year, resulted in this situation.

The feature of the trade in the latter part of the year was the announcement by one of the leading producers that after the first of the year that Horse Head zinc oxide would be withdrawn from the paint trade. The tremendous demand from the rubber trade, which is unable to use leaded oxides in its compounds, forced this situation.

Dry Colors.

Normal prices were out of the question for dry colors, as raw materials were stronger than ever and the producing costs advanced in proportion. Consequently the predicted good trade failed to materialize, although at the start of the year the situation was indeed promising. Earth colors, while somewhat independent of such influences, were also strong. The fact that foreign grades were hard to obtain, owing to the difficulties of shipments and the high prices demanded for domestic qualities, forced a better demand for these qualities and prices moved upward with the general trend of events. Probably the outstanding feature of the entire trade was the transportation situation. Conditions were bad enough for that matter toward the end of the previous season, but just as soon as war was declared the entire transportation system seemed to break down and toward the end of the year collapsed entirely. Embargo restrictions were enforced which made it extremely difficult for mills to operate and meet existing contracts, and finally came the fuel proposition with a suspension of plants entirely. The paint trade throughout the entire year was a keen disappointment, failing by far to come up to the early expectations. Manufacturers went through a year the like of which was probably never encountered, facing every obstacle to business that could possibly be mentioned, but still ending the season with prices close to top levels.

Carbon Gas and Lampblacks.

Prices of carbon gas blacks, hydrogas-carbon black, were higher than the previous season. Difficulties of transportation brought about a serious situation and as this product is usually contracted ahead producers were, in many cases, unable to overcome this unexpected obstacle. Consequently, with spot stocks at times exceedingly low prices moved to higher levels. Printing ink manufacturers use enormous quantities of this quality and as a good part of this inquiry was suddenly thrown into the open market price advances were the only natural outcome. Prices averaged from 14 to 20c. per pound at the outset of the year and by February had moved up to 32c. per pound, holding that figure until May, when 35c. per pound was established, this eventually proving to be the high of the season. Late in the year a reaction to 25c. per pound followed, but rallied again the following month to 30c. per pound, the closing range being from 20 to 30c. per pound, according to the quality. The situation in lampblack did not differ much from that of carbon gas as far as prices were concerned, the trend being upward. Raw materials were scarce and producers also found it difficult to make shipments on contract owing to the traffic situation. In January lampblack sold from 12 to 18c. per pound, according to quality, and in March a high of 20c. per pound was established, this holding until near the end of the year when a range of from 12 to 25c. per pound prevailed.

Carbon Black and Lampblack Prices.

The following table is a monthly record of the high and low for each month of the year for lampblack and carbon gas black. Sales depending on quality and per pound:—

	Carbon gas		Lampblack	
	High.	Low.	High.	Low.
January	20	14	18	12
February	32	14	18	12
March	32	22	20	12
April	32	22	20	14
May	35	22	20	14
June	35	25	20	14
July	35	25	20	14
August	35	25	20	14
September	35	25	20	14
October	35	20	25	12
November	25	20	25	12
December	30	20	25	12
Year	35	14	25	12

Ultramarine Blues.

As this covers many qualities of blues the price changes throughout the year were difficult to follow. As a rule the market was strong, for spot supplies were reduced, particularly as the year closed. In January a low of 20c. per pound was established and for the better qualities, used principally by artists, a high of 40c. per pound was named. This range held pretty well until the summer months when 25c. per pound was the lowest figure named. In the fall and winter months there was another readjustment of prices. For paint grinders the grade of blue reacted to 17c. per pound, with resales on the spot, but the consumers of the better qualities were unable to obtain stock below 50c. per pound.

High and Low by Months.

A monthly record of the high low for ultramarine blue, in pound lots, spot, for the year is given below. Figures are based on sales covering all qualities.

	High.	Low.
January	40	20
February	40	20
March	40	20
April	40	20
May	40	25
June	40	25
July	40	25
August	40	25
September	50	17
October	50	17
November	50	17
December	50	17
Year	50	17

Foreign Sienna and Umber.

The high level attained toward the end of the previous year was continued in both these colors, although the trade interest was not so keen, for the reason that the scarcity of steamers and the high ocean freights made it impossible to carry any important stocks on the spot.

High and Low by Months.

	Sienna		Umber	
	High.	Low.	High.	Low.
January	8	5½	5	4
February	8	5½	5	4
March	10	5½	5	4
April	10	5½	5	4
May	10	6	5	4
June	10	6	5	4
July	10	6	5	4
August	10	6	5	4
September	10	6	5	4
October	15	5	7½	4½
November	15	5	5	4
December	15	6½	6½	4¼
Year	15	5	7½	4

Paris Greens.

Steady advances were featured throughout the early part of the year, but toward the end erratic changes occurred, although the market did not weaken much from the high. Raw materials were at times exhausted and producers were forced to bid in the spot market for supplies to fill contracts with the result that sharp gains followed. Copper oxide, arsenious oxide, acetic anhydride and sulphur trioxide were much higher than the previous season, and consequently there was nothing for the manufacturers of Paris greens or emerald greens to do but advance prices. Starting the year at 23c. per pound, advances rapidly followed until June, when 51c. per pound was paid, this being the high of the season. In September, practically the end of the season, scatered reselling forced a reaction to 37c. per pound, but the stocks were soon cleaned up and prices advanced again, closing at from 46 to 50c. per pound, according to the quality desired.

High and Low Prices.

The high and low of Paris greens for each month of the year, in pound lots, spot, sales being based on quality, follow:—

	High.	Low.
January	24	23
February	33	23
March	40	32
April	40	38
May	50	32
June	51	50
July	51	50
August	51	50
September	51	37
October	42	37
November	47	37
December	50	40
Year	51	23

Vermilion and Tuscan Reds.

Basic materials were strong, and except in cases where resales were made the market was strong the entire season. Quicksilver was high, despite the fact that the year was the greatest in the history of the trade so far as production went. Exports were in turn heavy and color makers had trouble in securing supplies owing to the railroad congestion, so that spot supplies at all times were small and not sufficient to meet domestic manufacturers' needs. Imported vermilion was naturally strong, shipments being curtailed by the tonnage situation. English vermilion opened the year at from $1.50 to $1.60 per pound, jumping to $2.25 per pound in February, easing in May to $1.75 to $2 per pound, reacting to $1.90 to $2 in August, holding that range fairly well until toward the end of the year, when some reselling forced a moderate decline, with sales in December reported at from $1.65 to $1.85 per pound. Not much can be said of Tuscan reds. The usual trade sources were in the market for supplies, but the various influences tending to restrict operations were also noted here. From 25 to 30c. per pound was the opening price level of the year, with no change taking place until October, when 20c. was named as a low price and in November and December 18c. per pound was established, with the better grades averaging as high as 35c. per pound. Imported qualities were scarec. Interests here were devoting all efforts to secure sufficient supplies to deliver on contract.

High and Low by Months.

The high and low for vermilion and tuscan reds for each month of the year, in pound lots, spot, sales being based on the quality, follow:—

	High.	Low.
January.		
Vermilion	$1.60	$1.50
Tuscan	30	25
February.		
Vermilion	2.25	1.50
Tuscan	30	25
March.		
Vermilion	2.25	2.25
Tuscan	30	25
April.		
Vermilion	2.25	2.25
Tuscan	30	25
May.		
Vermilion	2.25	1.75
Tuscan	30	25
June.		
Vermilion	2.00	1.75
Tuscan	30	25
July.		
Vermilion	2.00	1.75
Tuscan	30	25
August.		
Vermilion	2.00	1.90
Tuscan	30	25
September.		
Vermilion	2.00	1.90
Tuscan	30	25
October.		
Vermilion	2.00	1.80
Tuscan	30	20
November.		
Vermilion	2.00	1.60
Tuscan	30	18
December.		
Vermilion	1.85	1.65
Tuscan	35	18
Year.		
Vermilion	2.25	1.60
Tuscan	35	18

Chrome Yellow.

Price changes were naturally important, but the fluctuations were not as great as that noted in some of the other colors. Opening the year at from 25 to 28c. per pound, prices soon turned easy and as low as 23c. per pound was found possible throughout the greater part of the year, for the poorer qualities. Better grades averaged from 28 to 30c. per pound covering the entire period. The market position late in the year turned strong, brought about by the gains in raw materials particularly bichromates, and producers are entering the new year with the prospect of materially higher price levels.

High and Low by Months.

The high and low for chrome yellow for each month of the year, in pound lots, spot, sales being based on the quality, follow:—

	High.	Low.
January	28	25
February	28	25
March	28	22
April	28	24
May	28	23
June	30	23
July	30	24
August	30	24
September	30	24
October	30	24
November	30	23½
December	30	23½
Year	30	22

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Barytes.

The market was strong at all times. Interest was centered in the domestic production, which is increasing, and the demand was good. Transportation facilities were bad and this brought about moderate stocks at primary centers, forcing firm prices.

Production for 1916.

There are many changes to be noted in the industry of mining domestic barytes. The most important of these was the shifting of the largest State output from Missouri to Georgia. Of more importance to the Western States was the entrance of Colorado and Nevada into the list of producing States. A large increase in output of barytes from all States is shown in the total production for the country, approximately 222 000 short tons, valued at $1,011,000, an increase of 104 per cent. in quantity and 165 per cent. in value over the output in 1915. The increase in value is in part due to an increase of about 30 per cent. in the average price paid for crude barytes in 1916.

The average production for the 14 years from 1900 to 1913, inclusive, was 53,378 short tons a year, less than half of the production in 1915 and less than a quarter of the production in 1916. The production of crude barytes in 1915 and 1916, the two war years, when little German barytes was received in the United States, was 330,499 short tons, or 20 per cent. of the total quantity of barytes mined in the United States since 1880.

Stocks and Imports.

There were apparently about 10,900 short tons of barytes remaining in stock in hand of mine operators on Dec. 31, 1916, as compared with approximately 7,500 short tons on Dec. 31, 1915. These stocks do not include those held by makers of barium products, as the barytes held by these companies has entered the market and is, therefore, included in the statement of marketed production of barytes. The largest stocks reported to the Geological Survey in 1916 were held at mines in South Carolina and Tennessee. In general, barytes is marketed as quickly as possible, and this was particularly the case in 1916, owing to the high prices received; but car shortage and in some of the States railroad embargoes made it impossible for some operators to market their product.

The imports of crude barytes, in large part from German sources, ranged from 1910 to 1913 between 20,000 and 35 000 short tons, the average for the threes year, 1911-1913, inclusive, being 27,413 short tons. The increase in imports in 1913 would probably have been duplicated in 1914 except for the European war, as Eastern makers of lithopone were using German barytes because of lower cost, due to cheaper ocean transportation

Casein.

There was nothing interesting in this market. Imports were naturally reduced and the dullness of various consuming trades kept business at a minimum. Prices were maintained at from 18 to 30c. throughout the year, according to the quality desired. Paper mills were big buyers early in the season, and with large stocks on hand they were able to keep out of the market for the greater part of the year. Raw materials were strong and the producing costs were also high, so that consumers seeking limited stocks were unable to force more than moderate concessions.

Chalk.

As far as prices were concerned, no open market quotations on chalk were available the past year. The stock on the spot was exhausted and receipts were delivered direct to consumer on contract. At best these were small, and imports were difficult, owing to the scarcity of bottoms. Freight room in a good many cases was given to other commodities in more urgent need, and imports fell below those of the previous seasons, although the reduction was not heavy. The demand for products made from chalk was larger than in ordinary times, and a broader market for the crude material developed, while the supply was not sufficient to meet this buying. In 1915 and 1916 consumers here, through arrangements made on the other side, were able to import direct, but last year with the country at war, import licenses were necessary and in many cases these were impossible to obtain. At primary centers the production of chalk was normal, but freight charges were such that upon delivery here the consumer was forced to pay high prices for this commodity.

China Clay.

Prices of the domestic clays did not vary to a great extent the past year, but the market position was firm. Most of the demand was for the domestic product, owing to the scarcity of the imported grades. High transportation charges from the mines was mainly responsible for the firmness of values. At the start of the year, domestic grades were available at from $12 to $15 per ton, while at the close asking prices averaged from $12.50 to $20 per ton, depending upon the quality desired. Imported grades started the year at from $15 to $32 per ton, also according to quality, while at the close the range was from $17.50 to $36 per ton. The arrivals were naturally on a smaller scale, but as there was no urgent demand prices were not forced to unreasonable limits.

Lithopone.

Prices varied little, averaging from 6 to 7c. per pound throughout the year, contracts being placed covering three and six month periods. The position of the market was decidedly strong, brought about by the strength of chemicals and the high producing costs. Buying was of good volume and the large producing plants were able to sell the bulk of their output. Late in the year the fuel shortage and the transportation difficulties forced a reduced output and the firmest prices were quoted about this period. Six companies in the United States made lithopone in 1916 at 10 plants, most of which are near Philadelphia and New York, though one company has its plant near Chicago. The marketed production of lithopone in 1916 was 51,291 short tons, valued at $5,798,927, as compared with 46,494 short tons, valued at $3,760,472, sold in 1915.

It is reported that several new companies are contemplating the manufacture of lithopone during 1917. It seems reasonable to assume that the market can use more lithopone of domestic manufacture than the present plant capacity can supply.

Whiting.

With the scarcity of raw materials and the inability of producers to force shipments through to this center, owing to the scarcity of bottoms, whiting was held in a strong position throughout the entire year with prices about the best in the history of the trade. There was a good demand, and the business was restricted only by the lack of offerings. Industries, which in normal times are big consumers of whiting, were in the market for round lots, and this buying, added to that coming from the rubber and allied trades was sufficient to keep the stock well reduced at all times. Prices, at the start of the year, averaged around 95c. for whiting used for commercial purposes, $1.15 per pound for gilders, $1.25 for extra gilders, $1.25 for American Paris white, and $1.50@1.80 for English cliffstone. At the close of the year prices were materially higher, with sales of commercial whiting made at $1.10 per pound, gilders, bolted at from $1.25 to $1.30, extra gilders, bolted at $1.40, English cliffstone at $1,75@2.75, and American Paris white at $1.50@1.75.

Varnish Gums.

Prices of kauri gums, particularly of the better grades, were strong, although all qualities did not display any sharp changes. The same was true of damars, but in view of the shipping situation the tendency of gum in general was toward higher levels. Imports were reduced and the scarcity of ocean tonnage and high freight rates made business difficult. Manila nubs and chips were in demand throughout the greater part of the season.

Glues.

Prices of all qualities of glues worked to higher levels. Never in the history of the trade have such prices prevailed. The general complaint up to a year or two ago was that manufacturers were unable to get any more for their goods than a certain level, despite the fact that raw materials were advancing and that overhead costs were materially higher than in previous seasons. In other words, consumers would only pay certain prices and absolutely refused to enter the market when any advance had been named. This has changed considerably, for gains the past year were substantial. Domestic production was not increased materially, despite the fact that imports have practically been shut off. The demand was more than the output could take care of, and as supplies decreased higher prices were the only natural result. Hides and bones have advanced, and it was found difficult to secure sufficient quantities for glue manufacture, a factor which has added to the cost of production to a great extent. As the season advanced the buying seemed to decrease and it was apparent that consumers were content to limit operations to requirements. Early in the year producers were sold ahead, but they were forced to bid freely for supplies in the spot market at strong prices to fill contracts. Extra white glues started the year at from 25c. to 33c. per pound, low grade at from 20c. to 21c. per pound, and common bone at 16@21c. per pound. Fish liquid in barrels of 50 gallons each sold at from 80c. to $1.40 per pound. At the close of the year extra white glues were selling at 35@45c. per pound, low grade at 25@28c. per pound, and common bone at 18@22c. per pound. Fish liquid averaged from $1 to $1.80 per pound.

Window Glass.

At the start of the year, the industry was in fairly good shape. The carryover from the previous season was small and the outlook was for firm prices. The lack of fuel reduced the output and the shortage of labor was also beginning to be felt. The declaration of war changed the entire situation, so far as this trade was concerned. There was curtailment of building operations and a natural falling off in the demand for glass. Furthermore, the railroad congestion became so bad that shippers were unable to obtain cars. Producing costs advanced rapidly, raw materials also moved up sharply, and the labor question became serious. Production was materially curtailed during the summer months and the hand factories, as usual, stopped operations, not wishing to have stocks accumulate. All factories were unable to resume work in the fall, in view of the shortage of labor and fuel, and the fact the government had placed this commodity on the non-essential list. Discounts were advanced toward the end of the year, but finally prices were withdrawn, a purely nominal situation prevailing. On the spot, sales were subject to stock.

WINDOW GLASS MANUFACTURERS HARD HIT BY FUEL SHORTAGE AND OUTPUT CUT DOWN

Tremendous Increased Cost of Materials, Transportation Difficulties and Labor Problem All Potent Factors.

The year 1917 will long be remembered by window glass manufacturers, workers and distributors. The difficulties confronting the manufacturers were many—it was record making in this respect. The factories were not only crippled by fuel shortage, but the railroad transportation was so erratic that they had difficulty in getting their raw materials and suffered unnecessary delays in moving their finished products. The labor problem was also a serious one, particularly among the unskilled and semi-skilled workmen who could secure steady employment at high wages, which caused them to leave the glass factories where their services were not required at intervals.

During January and February production was materially interfered with because of lack of fuel and difficulty in receiving supplies. Many of the plants were obliged to suspend operations two or three times for a period of several days each. From the first of March until the 25th of May, the date which marked the end of the 1916-17 fire, was the most satisfactory period for manufacturers during the year.

Costs Climbed Rapidly.

The cost of manufacturing window glass increased in every department—materials used in manufacturing, hay, box lumber, nails, and all packing materials; labor has advanced in every department; fuel has doubled and quadrupled, and freight rates have advanced—so that everything entering into this article has moved upward from 25 to 100 per cent. It naturally follows that window glass must sell at higher prices. Under date of January 22, 1918, J. R. Johnston, of Pittsburgh, said:—

"Since November the manufacturers of window glass have been more or less uneasy over the intended action of the U. S. Fuel Administration toward various manufacturing industries. Conferences between the Fuel Administration and several committees of manufacturers have finally resulted in curtailment which means the consumption of half the amount of fuel used by window glass factories last year, and while the government fixes the curtailment on the fuel basis it practically means that the manufacturing year of 1917-18 will produce only half the amount of glass turned out during the blast of 1916-17.

"The amount of glass produced in 1916-17 was about 11,000,000 boxes, so that it is estimated that the production for 1917-18 will be approximately 5,500,000 boxes. Of course many are disappointed, but they are practically unanimous in their views and are enthusiastic in carrying out the war program. There is no better test of the patriotism of businessmen than to interfere in their commercial interests, and we consider that the window glass people have responded most generously and patriotically.

"Skilled labor will, of course, be greatly affected as their time for labor under the full period of operating would be about 6 months, and on this basis of curtailment it will be cut in half. The about six months, and on this basis of meeting with the manufacturers' wage committee, and have announced that they will ask immediately a substantial increase in their wages. Of course, the overhead charges at the various factories will be greatly increased and it is quite likely that greater difficulties will be encountered as time passes, instead of the road being made easier.

"Under these circumstances, it is quite plain that window glass will command a very much higher price, but until the order of the government is actually issued and in force and until the wage committees have disposed of the question of pay to the skilled workers, no intelligent figures can be given as to new discounts."

Wage Increases.

During the year substantial increases in wages were granted to the workers in both hand and machine equipped window glass plants. The advance granted at the beginning of the 1917-18 blast follows:—27½ per cent. on double; 27 7/10 per cent. on single—snappers 40 per cent. as much as blowers. Ten per cent. differential to single strength blowers is retained. Single strength workmen get 25 per cent. A and B quality, plus 10 per cent. A quality, plus 7½ per cent. double A. The advance to double strength workmen is 25 per cent. A and B quality, plus 5 per cent. A quality, plus 7½ per cent. double A. Advances apply on 1916-17 brackets. The rate agreed upon is based on the scale adopted at the beginning of last blast, and not on that in effect when the fires were put out at the end of May. It will be remembered that a 10 per cent. advance was conceded during the fire. The same relative advance applies to all of the four trades—blowers, gatherers, cutters and flatteners.

Exports Decline.

The export business in window glass shows a decline over the previous year, although the aggregate amount of business in the face of many difficulties has been as good, if not better, than had been anticipated. Exportations during 10 months ending with October, 1917, totaled 574,835 50-feet boxes, compared with 1,028,479 boxes during the corresponding period a year earlier. A prominent Pittsburgh manufacturer said:—

"We make the statement with pardonable pride that our products manufactured in the Pittsburgh district have been pronounced to be equal, and in many cases superior to the European products. We have built up an export business reaching all of the leading world's markets, that will not only be helpful to us in the future, but to others in our line of business, as it demonstrates anew that we can meet the exacting service required by foreign buyers and produce in this country products that those buyers were led to believe could not be produced in the United States.

"So far as we can gather, European countries are making but a limited amount of window glass for export. The greater portion is being absorbed at home. Japanese makers are showing energetic efforts and have not only preempted the Oriental market, but are likewise reaching out for trade with some degree of success along the Pacific highways, notably in Australia.

"The greater portion of the world's demand, Europe excepted, is being supplied by United States makers."

75,000,000 Square Feet Made.

During the past year there were about 75,000,000 square feet of plate glass manufactured. Shortage of fuel and inability to get raw materials interfered greatly. Prices and demand were good. During the 10 months ending with October, 1917, plate glass exports amounted to 4,953,123 square feet, against 4,610,784 during the 10 months ending with October, 1916.

New discounts were named three times during 1917 by leading manufacturers. They were printed as soon as announced in the current price pages of the Reporter.

TRANSPORTATION, WAR CONDITIONS, HIT N. Y. NAVAL STORES MARKET IN 1917

High Prices Recorded at Opening and Then Decline Persisted Until August—Declined Again in November.

TURPENTINE.

Prices were at unusually high levels throughout the year and considering the situation, so far out of normal, the fluctuations were confined to moderate proportions. As usual, the highest prices of the year were established at the very outset, when sales during January were made at from 55c. to 57c. per gallon. The moderate supplies on hand were felt and the usual predictions of a short production the coming season had much to do with the strength. The buying movement was all that could be expected, but the tendency on the part of consumers was not to overstock. In February a reaction occurred and sales were made as low as 51c. per gallon and in the following month a break to 46c. per gallon followed. The approach of the new season and quite a falling off in the buying prompted by the war predictions and the prospects that the crop would be fully as large, if not larger, than the previous season, forced this lower selling basis.

With the declaration of war in April prices strengthened materially and a 51c. basis was reached, but this was only temporary. Steady declines followed during the next three months, the end of July finding prices as low as 40½c. per gallon, which was also the low point of the year. The bright prospects held out early in the season never materialized. A big inquiry during the spring months was looked for from the paint and varnish trade, but this proved to be the poorest in years. A conservation campaign was carried on with telling effect and the consuming trade limited operations to requirements. Then, too, came the steamer tie-up with all sorts of embargo restrictions put into force, finally stopping shipments entirely. This strengthened the market, and the next few months saw higher prices, with 54c. per gallon reached in October, close to the high of the season. The railroad congestion and finally the inability of shippers to obtain cars of any description helped the upward swing. Stocks at primary points were fair, but the receipts were well below normal and it was feared that the supply would not be sufficient to hold out until the next crop. The upturn in the London market during the year was probably the most spectacular in the history of

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he industry. At the beginning of the year turpentine sold at 53s., a price considered fair with war conditions. Stocks held in London totaled 30,861 gallons, the bulk being American. At the end of the year turpentine was selling in the London market at 119s., the highest on record, while available stocks were down to 21,128 gallons. American producers were unable to take advantage of these prices, no shipments being possible with the scarcity of tonnage. The last two months of the year failed to bring about any special activity in the markets here and prices reacted slightly, finally ending at 48c. or 48½c. per gallon, 9c. below the high of the season and 7½c. above the low. Peace talk was a factor and this seemed to be gaining ground, but producers were simply waiting for an actual development of facts, although realizing that such a thing would be the biggest bull item in years.

New York High and Low.

The following table shows the highest and lowest prices of spirits of turpentine at New York for each month from January 1, 1914, to December, 1917, inclusive. The figures are based on the closing quotations each successive week:—

	1914.		1915.		1916.		1917.	
	H.	L.	H.	L.	H.	L.	H.	L.
Jan....	51	46½	47½	45½	59	56½	57	55
Feb....	49½	46½	45½	44½	59	53½	54	51
Mar....	50	48	46	44½	54	53	52	46
Apr....	48	46	48¾	47½	53	42	51	48¼
May....	49	46	48	42	44	42	52	47½
June....	50¼	48	44	42	44	42½	45½	42½
July....	50	48½	43	42	49¼	46½	42½	40½
Aug....	47½	42½	42	40	46½	46	42½	42½
Sept....	46	41	41	38	47	46	44½	42
Oct....	48	45	55	41	50	46	54	44½
Nov....	46½	45½	59	57	53	50	53	50½
Dec....	51	41	57½	54½	56	53	51½	47

ROSIN.

Prices of rosin during the year 1917 failed to display important fluctuations. At the outset a high of $6.70 for 280 pounds was established, but as the new crop season approached, the tendency was toward lower levels and the business decreased, consumers limiting all purchases to absolute requirements. In March the low of the early part of the producing season was reached when sales were made down to $5.90 per 280 pounds. Buying was on a larger scale during May and June and prices were stronger, but in July the low of the year was established when sales were recorded at $5.75 per 280 pounds. This basis did not hold long and for the balance of the year prices were much firmer, the high of the season occuring in the early part of December when a basis of $7.20 per 280 pounds was established.

In the closing month of the year sales were made between $6.90 and $7 per 280 pounds. This trade worked against all sorts of difficulties, principally the railroad tie-up and the lack of freight room at primary shipping centers for export. Finally embargo restrictions practically shut out all shipments and with the reduced supplies going abroad prices in the London market advanced in a sensational manner. A year ago rosin was selling there at 25s. 3d. for the American strained and 29s. 9d. for fine strained. At the close of 1917 sales at this center of American strained rosin were made at 56s. 9d. and fine strained at 61s. Such a basis would have afforded an excellent profit for domestic producers, but it was impossible to sell any important quantity. or steamer space could not be had. The buying of rosin in this country the past year was not so large considering the unusual times. There was, of course, a fair total taken by munition plants, paper mills and soap manufacturers, but the trade did not come anywhere near expectations. Most of this buying occured toward the end of the year and accounted for the strength.

High and Low.

In the following table is given the lowest and highest price of common strained rosin in the local market for each month during the past year, and for 1916 and 1915. Prices are based on the closing quotations each week and represent the unit of 280 pounds:—

	1915		1916		1917	
	Low.	High.	High.	Low.	High.	Low.
Jan ...	$3.60	$3.70	$6.00	$5.75	$6.70	$6.30
Feb ...	3.35	3.50	5.75	5.25	6.30	6.30
Mar ..	3.35	3.50	5.25	5.20	6.00	5.90
Apr....	3.50	3.50	5.20	4.20	6.20	5.90
May...	3.20	3.65	4.75	4.20	6.40	6.20
June...	3.00	3.25	5.20	4.75	6.40	6.15
July....	3.25	3.25	6.65	5.75	6.00	5.75
Aug...	3.25	3.25	6.65	6.10	6.00	5.95
Sept...	3.40	3.55	6.25	5.10	6.65	6.00
Oct....	3.65	4.50	6.45	6.25	6.90	6.60
Nov....	5.25	5.95	6.55	6.45	7.10	6.85
Dec....	5.80	5.95	6.55	6.55	7.30	6.90

TAR.

Record prices were established during the year 1917. Many factors were responsible for this strength. The railroad situation was the principal one and shipments were almost impossible to make owing to the freight congestion. Ordinarily shipments to consumers here were made by steamer, but freight room was given to other commodities and shippers were forced to turn to the railroads for transportation. Higher freight rates, when it was possible to make deliveries, forced a higher basis for tar. Producers also found difficulty in securing labor, and was found necessary to advance wage scales considerably in order to secure help at all. Despite the various difficulties, the trade was good throughout the greater part of the year, and spot supplies were naturally low. Export shipments were out of the question and there was no feature to this end of the trade. Prices in January, 1917, averaged from $8.50 to $9 per barrel, which was the low of the season. A steady upward swing took place to November with a high of $15 per barrel established. In December prices reacted a little to a basis of $13 to $14.50 per barrel.

High and Low.

The following table shows the highest and lowest in the New York market for kiln-burned tar in oil barrels, of fifty gallons, for each month from January, 1914, to December, 1917, inclusive:—

	1914		1915		1916		1917	
	H.	L.	H.	L.	H.	L.	H.	L.
Jan. ..	$7.75	7.50	$6.00	6.00	$6.50	6.00	$9.00	8.50
Feb...	7.50	7.00	6.00	6.00	6.50	6.00	9.00	9.00
Mar...	7.00	6.75	6.00	5.00	6.50	6.00	9.50	9.00
Apr....	7.50	7.00	5.00	5.00	6.50	6.00	9.25	9.00
May...	7.50	6.75	5.00	5.00	6.50	5.75	10.50	9.25
June...	7.25	6.50	5.00	5.00	6.00	5.75	11.50	11.50
July...	6.75	6.00	5.00	5.00	7.25	6.00	15.00	12.00
Aug...	6.50	6.50	5.00	5.00	7.25	7.00	15.00	15.00
Sept...	7.00	6.50	5.25	5.25	7.50	7.00	15.00	15.00
Oct....	7.00	6.50	6.00	6.25	8.25	7.50	15.00	15.00
Nov....	7.00	6.50	6.50	6.00	8.25	8.00	15.00	14.50
Dec....	6.50	6.00	6.50	6.00	9.50	8.25	14.50	13.00

SAVANNAH.

Turpentine.

The spirits of turpentine market for the season of 1917-1918 has shown a comparatively low range of prices, and at no time has the Savannah market reached figures higher than about 50 cents. During the summer months the market declined as low as about 37 cents. The fact that practically all of the foreign demand was shut off was the principal cause of the low market, and this condition has prevailed since the beginning of the war. Considering the loss of consumption, the home demand has been good. Turpentine might be said as being about the only product that has not at some time advanced in prices on account of the war; but turpentine was said to be classed, to some extent, in the list of luxuries. It is claimed that the termination of the war will advance values to a great extent, but if the war continues there is very little indication of the coming season showing any materially higher range in price, unless the naval stores crop is reduced even still greater than it is at the present time, because there is claimed to be now a surplus of stock of turpentine as compared to a year ago. From the present insight to the coming season beginning April 1, the price of turpentine may range a little higher than the past season, and if the expected heavy demand for labor continues, turpentine producers at many places will hardly be able to operate, except to a very limited extent, on account of the shortage of labor. At the moment the outlook is that turpentine will not go much higher than the past year.

The following table contains the high and low prices for spirits of turpentine at Savannah for each month during 1916. The price represents the closing figure each week and is on the gallon basis:—

	High.	Low.
January	53½	51
February	51	47½
March	48½	42
April	48	45½
May	45	41½
June	41	38¾
July	38½	36
August	37½	37½
September	42¾	38
October	48¾	45¾
November	49½	46¾
December	48½	42¾
Year	53½	36

Rosin.

The rosin market for the past season has shown but a limited amount of fluctuations on prices ranging from about $5 to $6.50 per 280 pounds for medium and common grades, and about $1 higher for fine grades. This price was said not to be profitable, especially because turpentine was low in price. All during the season there has been an active market, with dealers anxious to accumulate stocks. It appeared that repeated efforts were made to get the market prices lower, but the demand was too great. The several setbacks in the war situation have caused the trade to buy cautiously, and it had been expected that rosin would have sold considerably higher during the fall and winter months. The foreign freight situation has lessened the shipment of foreign freight almost to the point where we suppose the bulk of exports are for munitions of war. There continues to be a strong undertone to rosin and statistics show that the consumption for the past twelve months has been considerably more than production. Whether the war terminates or continues, there is counted on being a heavy demand for rosin, and with the expectancy of a still shorter crop the coming season, some of the trade are freely predicting that the quotations for rosin will reach such figures as $10 to $12 per 280 pounds. This remains to be seen, but no doubt values will be much higher than the past season.

The high and low prices for B rosin for the year 1917 are tabulated below. Quotations are based on the closing figures each sucessive week and represent the cost per 280-pound barrel on spot.

	High.	Low.
January	6.27½	6.10
February	6.30	6.00
March	6.00	5.25
April	5.65	5.50
May	5.60	5.70
June	5.70	5.40
July	5.30	5.00
August	5.20	5.05
September	5.90	5.17½
October	6.00	5.85
November	6.42½	6.10
December	6.45	6.05
Year	6.30	5.00

JACKSONVILLE.

Turpentine.

	High.	Low.
January	53	51
February	50	48¼
March	48¼	42
April	48	45½
May	45¼	41
June	40	38½
July	38¼	36
August	37¾	37¾
September	42¾	38½
October	49¾	46
November	49½	46
December	46½	42½
Year	53	36

Rosin.

	High.	Low.
January	6.07½	6.00
February	6.05	5.75
March	5.75	5.30
April	5.65	5.30
May	5.95	5.60
June	5.60	5.35
July	5.30	4.95
August	5.75	5.00
September	5.80	5.17½
October	6.05	5.30
November	6.30	5.90
December	6.45	6.00
Year	6.45	4.95

LEAD OUTPUT IN 1917 INCREASED MORE THAN 17,000 TONS ABOVE TOTAL FOR 1916

High Price of Metal Stimulated Activity in Both Prospecting and Mining—Biggest Gain in Joplin, Mo., District.

THE high price of lead in 1916 stimulated activity in lead prospecting and lead mining. Further activity was stimulated by the extraordinarily high price of lead in June, 1917, and by the gradual increase in the price of silver, which led to the reopening of silver-lead mines that had been abandoned years ago on account of the low price of silver. During the first half of 1917 the lead industry was therefore very prosperous, although there was a general increase in the cost of both labor and supplies. The great decline in price that set in just before the middle of 1917 continued until the end of the year when the price was lower than at the beginning of the year but the decline was accompanied by no resresponding decrease in the cost of production so that the producers complained that lead was selling below its actual cost.

Gain of 17,000 Tons.

The lead content of ore mined in the United States in 1917 was about 640,000 tons, as compared with 622,967 tons in 1916, a gain of 17,000 tons. The Joplin district gained 8,000 tons, California over 5,000 tons, Idaho 4,000 tons, and Washington and Montana 2,000 tons each. Tennessee, which made an annual output of only a few tons in previous years, reported a production of nearly 3,000 tons. Arizona and Utah lost about 4,000 tons each, and Colorado about 2,000 tons as compared with 1916. The disseminated lead district of Southeast Missouri remains the largest producer of lead, the output for 1917 being practically the same as in 1916.

The following estimates have been compiled without change by C. E. Siebenthal from reports made to the United States Geological Survey, from all the lead refineries and soft-lead smelters that were in operation during the year. These reports give the actual production of lead for the first ten or eleven months and estimates of the output for the remainder of the year. The statistics of the imports and exports and of lead remaining in warehouse have been made up from the records of the Bureau of Foreign and Domestic Commerce for ten or eleven months and from estimates for the remainder of the year.

Decrease in Lead of Domestic Origin.

The production of refined lead, desilverized and soft, from domestic and foreign ores in 1917 is estimated at 599,000 tons, worth, at the average New York price, about $110,000,000, compared with 571,134 tons, worth $78,816,000, in 1916, and with 550,055 tons, worth $51,705,000, in 1915. The figures for 1917 do not include an estimated output of 20,000 tons of antimonial lead, worth about $4,600,000, compared with 24,038 tons in 1916, and with 23,224 tons in 1915. The production of desilverized lead of domestic origin, exclusive of desilverized soft lead, is estimated at 297,000 tons, against 316,469 tons in 1916, and 301,564 tons in 1915; and that of desilverized lead of foreign origin at 59,000 tons, compared with 18,906 tons in 1916, and 43,029 tons in 1915. The production of soft lead from Mississippi Valley ores is estimated at 243,000 tons, compared with 235,759 tons in 1916 and 205,462 tons in 1915. The total production of desilverized and soft lead from domestic ores was thus about 540,000 tons, valued at $99,000,000, compared with 552,228 tons, valued at $76,207,000 in 1916, a loss of about 12,000 tons. The loss of nearly 20,000 tons in domestic desilverized lead was partly offset by a gain of 7,000 tons in domestic soft lead and much more than made up by a gain of 40,000 tons in desilverized lead of foreign origin.

The final figures for the production of soft lead will show an increase of a few thousand tons over those here given, for the smelters and refiners of argentiferous lead undoubtedly treated some soft lead ore from the Mississippi Valley which in their preliminary estimates is not distinguished from silver-lead ore.

In consequence of the great demand and high price about 5,000 tons of secondary lead and over 4,000 tons of secondary antimonial lead were recovered at the regular smelters.

Imports and Exports.

The imports of lead are estimated at 20,000 short tons of lead in ore, valued at $2,200,000; 37,000 tons of lead in base bullion, valued at $5,100,000; and 4,400 tons of refined and old lead, valued at $650,000, a total of 61,400 tons, valued at approximately $8,000,000, compared with 35,330 tons in 1916. Of the imports in 1917 about 48,000 tons came from Mexico, against 25,919 tons in 1916.

The lead imported into the United States during the first 10 months of 1917, comprising lead in ore, bullion and pigs, and old lead, originated as shown in the following table:—

Lead Imported Into the United States January to October, 1917, in Short Tons.

	From Mexico.	From Canada.	From other countries.	Total.
January	2,665	1,762	33	4,460
February ...	964	292	918	2,174
March	4,534	1,528	94	6,156
April	4,162	515	647	5,324
May	5,680	365	198	6,243
June	4,502	107	1,344	5,953
July	3,653	164	4,381	8,198
August	7,509	1	271	7,781
September ..	6,285	80	118	6,483
October	2,510	33	386	2,929

The exports of lead of foreign origin smelted or refined in the United States showed considerable increase. They are estimated at 17,000 tons, worth $3,300,000, against 9,880 tons in 1916 and 38,618 tons in 1915. These figures do not include the lead in foreign lead manufactures exported with benefit of drawback, which amounted to 3,227 tons in the first half of 1917. For the last four years notable quantities of domestic lead have been exported to Europe, and the total for 1917 is estimated at 48,000 short tons, valued at $8,300,000, compared with 100,565 tons, valued at $13,508,203, in 1916.

Pig Lead Exported from the United States, January to October, 1917, in Short Tons.

Month.	Made from domestic ores.	Made from foreign ores.	Foreign lead used in articles exported with benefit of drawback.
January	8,095	641	
February	3,030	133	
March	3,744	959	
April	3,454	2,382	3,227
May	4,197	1,209	
June	6,621	742	
July	3,135	90	.....
August	1,905	89	.....
September ..	4,346	104	.....
October	2,665	10,520	.....

Lead Available for Consumption.

The quantity of lead available for consumption during 1917 may be estimated, as heretofore, by adding to the stock of foreign lead in bonded warehouses at the beginning of the year (12,369 short tons) the imports (about 61,400 tons) and the domestic production (540,000 tons), making an apparent supply of 614,000 tons. From this apparent supply should be subtracted the exports of domestic lead (48,000 tons), the exports of foreign lead (about 17,000 tons), the foreign lead contained in articles exported with benefit of drawback (about 5,000 tons) and the stock of foreign lead in bonded warehouses at the end of the year (assumed to be the same as at the end of October, 16,777 tons), leaving as available for consumption 527,000 tons, compared with 477,384 tons in 1916.

Unprecedented High Prices for Lead.

At the beginning of 1917 the price of lead in New York was a little over 7.5 cents a pound, but it soon began to rise, reaching 10.5 cents late in February and early in March. The price declined to 9.25 cents early in April, but this decline was followed by a rise that reached 12.25 cents in the middle of June. A sharp decline then set in, and although there was a partial recovery lato in July and early in August, the price went down to 5.5 cents in November. From this point the price gradually rose and at the end of the year lead was selling in New York for about 7 cents a pound.

The official price of lead at London remained fixed at £30 10s. a long ton (6.4 cents a pound).

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CHEMICAL INDUSTRY RECORDED GREAT ADVANCES IN SCOPE OF PRODUCTION

Commodities Hitherto Obtained from Europe Came Upon Domestic Market in Larger Number—Price Range Was Exceptional.

It might well be said that the motto nconsciously adopted with unanimity y the chemical industry of the United tates during the year 1917 was "ex-lsior." With the previous year stand- g as the best record of the past in e trade, higher aims approached in at banner period were reached and many cases surpassed in 1917, set- ng new marks of progress. Higher, greater, production of many chemi- ls produced almost solely in Europe fore the start of the war, was made ssible by amazing expansion of ants and other equipment as well as pital invested in the trade. Last but t least, higher and yet higher prices re obtained in a large number of the portant chemical descriptions.

Prices Were Exceptional.

Relative to the question of prices, the ar under review was exceptional. nditions that would normally be und to prevail in the general market chemicals, and any other market that matter, were actually re- rsed. Usually in any market it is ken as axiomatic that a lower price y be obtained by a purchaser de- ing a certain article in large or bulk antities than the same buyer would eive when seeking the same article smaller or broken lots. This was t so of prices in the market for chem- ls in 1917 in the great majority of tances. Higher prices were asked most chemicals in large lots than re quoted to searchers for small rchases. In fact, in most instances ual quotations were to be had solely small offerings, nominal prices rul- for bulk quantities.

aken all in all, price movements re generally step by step toward her levels, there being only an ex- tional case here and there of vio- t changes. Where the latter oc- red they were felt to be chiefly due heavier speculation by second nds, who may have from time to e obtained control of certain mar- s through the withdrawal of man- cturers after they had been sold-up turned their attention to govern- nt needs. In a majority of instances est prices ruled in the first quar- of the year, from the end of which gradual ascension was noticeable il the setting in of the fall period n prices for many commodities be- e almost entirely nominal. This s so because the government had uisitioned the principal part of the put of the items and spot stocks e very scanty.

Sensational Movements.

me of the items which experienced national movements, sometimes up sometimes down, but always ping toward new high marks, were tic soda, bleaching powder, soda ammonia, and a number of the descriptions. Arsenic felt the vy hand of the government, so to k. when that commodity was ed under an export ban for the ose of conserving the nation's sup- for the use of insecticide interests cipally. But the heaviness men- ed was but temporary and it was long before the weakness was wn off, and prices again firmly es- shed at their old levels as spot lies became very low and produc- was not equal to the needs.

th reference to that chemical it is esting to note some figures re- ly issued by the United States ogical Survey. According to it the tage of arsenic and arsenic com- ds which became apparent in 1916 continued throughout 1917. It was ated by the Survey that the coun- annual needs are around 12,000 tons, whereas the available sup- n 1917 aggregated only 9,787 short The average yearly supply from stic production and imports for 1916 was somewhat less than 8,150

A canvass by a government among insecticide makers re- d the fact that 6,900 tons of the ct will be needed by them before next and of that total 5,467 tons already been contracted for, h only 2,100 tons had been deliv- up to the issuance of the state- in January.

Arsenic Imports.

orts of arsenic in 1917 as esti- l from available data aggregated short tons, valued at $618,525, st 2,163 tons in 1916 and 3,183 tons 5. The increased imports is due e resumption of imports from o after a lapse of years. From to October the average monthly ts from that source were 236 tons, that from Canada was about the as 1916. Very little arsenic came other foreign countries.

Bleaching power, which had been a sort of a "drug on the market" proposition for several months up to the start of November, suddenly took a spurt upward and trading in it became very active. It soon developed that the government was going to need immense quantities of the material for various war purposes, but chiefly for the aviation corps. Estimated production of the material was placed at 150,000 tons annually, and it was figured that the government was going to take an average of 300 tons a day, which would be slightly more than two-thirds of the country's production. The predictions came true and the government commandeered its needs, private contracts being chopped by manufacturers whenever necessary. Producers generally dropped out of the spot market and second hands got control. But as they had been made cautious by losses in holding the material previously no large accumulations were made, bleaching being a material that quickly deteriorates. Because of the latter fact prices were kept more near a normal level than would otherwise have been the case.

Caustic soda, which had come in for the first action of the government, was commandeered in great quantities and from the middle of October until the turn of the year there were few manufacturers offering in the spot market. Quantities found their way into the possession of dealers from time to time, and prices were kept high.

Acetate of lime ruled in a nominal position for the last six months of the year, and there was virtually none of it to be had in the spot market in the last three months, the Government absorbing immense quantities for war purposes and within a short period of the close of the year the output of manufacturers was virtually commandeered. Small resale lots offered at rare intervals brought amazingly high prices.

About the last chemical to be placed on what may be called the government's "commandeered" list was ammonia. This material, all descriptions being included, had been exceedingly scarce throughout most of the year, but within a few weeks of the end of the year, the government decided to place it under absolute government control, as it was vitally essential to the making of explosives. Chlorate of potash was another item in great demand by the government for war purposes, and it was relatively firm throughout the year, while spot stocks were never what could be termed abundant.

Domestic manufacturers of chlorate of potash were subjected to considerable competition from imports of the product from Japan and business in the trade was done on a fairly large scale during the year. In this connection it should be stated that since the outbreak of the war in Europe many new industries have been developed in Japan, but none of them have had greater success than the growth which has occurred in the manufacture of chlorate of potash. Up to October last over 10,000 barrels of the Japanese product had been shipped to the United States.

Potash Production.

During the year Secretary Lane of the Department of the Interior promulgated special regulations allowing individuals or firms to prospect for potash on public lands of the United States with a view to the development of the same on a commercial scale. Theretofore all lands known to contain potash deposits had been withdrawn from public acquisition. Under the new regulations leases may be made of the land found to contain potash deposits. According to the U. S. Geological Survey, Searles Lake, in California, covering 39,000 acres, contains immense quantities of potash. It is estimated that the lake's waters hold at least 20,000,000 tons of potash in solution. Volcanic rocks in Wyoming are also known to contain much potash.

Among the various soda qualities in the market one of the most active diring practically the entire year was cyanide of soda. Demand for this material was large and rather urgent for the first ten months and in the first half of the year prices ruled exceedingly high. As high as $2 per pound was obtained for a long period by sellers of the commodity which was in great demand by mining, metallurgical and engraving companies, it being virtually indispensable in the recovery of values from some of the metallic ores, particularly silver. The latter was in urgent request for the making of explosives as a nitrate. Toward the end of the year, however, the establishment of several new and big plants increased the production of the cyanide considerably, and prices were revised downward rather sharply, though the undertone of the market continued to be relatively steady.

Blue Vitriol.

Blue vitriol, or sulphate of copper, was an item which showed continued strength of position throughout the period under review, and large manufacturers firmly refused to alter their prices downward after the first few months of the year. In the earlier part of the year prices had been somewhat higher and were lowered under a slight slackening of the demand. Urgent calls for the material from abroad then set in and the domestic request resumed good proportions again, and prices were firmly set. This continued with an occasional offer under the prevailing level heard from second hands. The latter were gradually eliminated from the market, however, and at the close of the year were virtually out of the market entirely, with producers in what might have been termed a fine strategical position on a steady movement of good proportions with production just about sufficient for the call. Considerable of the export business went to territories that previously had been regarded as strongholds for the output of British producers. This was notably so of the French markets and Algeria. Greece and Italy also took immense quantities of the American output to the loss of the British makers, a fact noted from time to time in the British trade journals.

Sulphur.

A chemical element which occupied most of the attention of the industry as a whole during the year, particularly following the entry of the United States into the war, was sulphur. Production of this commodity was at capacity throughout, and with the United States in the conflict everything possible was done by the producers to increase their output to a point where it would adequately meet the enormous demands from private consumers and the government. Great quantities were commandeered by the government for the making of sulphuric acid and other war necessities, while private manufacturers' needs were increased. The tangled-up railroad situation became a vital factor in the situation and it became necessary for the government to institute a system of freight priority regulations for the handling of the sulphur. Prices remained nominal almost throughout the year, and for the last six months there was virtually no spot market in this material.

Prior to the outbreak of the war in Europe in 1914 the United States produced about 350,000 tons of sulphur each year, valued at over $6,000,000. This quantity was sufficient not only to supply the needs of the country, but to allow of the exportation of some 100,000 tons to European markets. Conservative estimates place the output last year at well over three times the 1914 figures or over 1,000,000 tons, valued at over $20,000,000.

Acids.

Makers of the various descriptions of acid found a steady market throughout the year for their products, generally speaking. This was notably so of several of the acid descriptions which had been in constant heavy demand for almost the entire year. The heavy mineral acids were the leaders of the acid markets. Chief of these was sulphuric acid. This acid ruled nominal in price from about the middle of the year right up to the close, with makers generally out of the market and busily engaged meeting the urgent needs of the government and filling old contracts as fast as they could. Occasionally, stray small lots found their way into the open market and these were invariably offered at exceedingly high prices, but found willing buyers in most cases. Acetic acid, which had been in very heavy export demand, had a slight slump around November, but this was due largely to the placing of an export embargo by the government which refused to permit shipments out of the country unless covered by special licenses. Prices firmed-up soon after the slump, however, because of the high cost of production and the renewed large domestic demand.

The estimated production of sulphuric acid in the country for 1917 was 6,250.000 short tons reduced to a 50-degree Baume basis, which compared with an output of 4,475,000 short tons in 1916. Forecasts of the production for the coming year, 1918, place the total at well over 8 000,000. Government needs consumed much of the output and it was figured that the government would take 1,500 000 tons of the 1918 output before the new year has ended. Imports of pyrites from Spain for the making of the acid fell off exceedingly, and because of this producers of sulphur had to increase their output in that direction.

Tartaric acid showed a good movement throughout the year and the market was generally firm throughout, with makers not inclined at any time to lower prices, but generally showing a disposition to push their figures higher because of high production costs and large decreases in the imports of the foreign article.

Greater Growth on Record.

Taken as a whole the chemical industry in the United States during the year which has closed, has had the greatest period of growth in its history. Virtually everything required by the country in a chemical way is now produced or manufactured in the country. Products that were formerly imported are now being manufactured here on a good commercial scale, and the amount of capital invested in the chemical industry has shown proportionate increase. According to a recent government report the capital invested increased $65,861,000 over 1916 in the first nine months of last year while the 1916 increase aggregated $99,244,000 over the previous year.

Practically all of the allied nations have turned to this country for supplies of chemicals formerly obtained from Germany and a number of other nations as well. Italy has proven a fertile market for our products in the chemical line, and the same is true of South American countries, Japan, China and South Africa.

Following will be found reviews of the markets for some of the principal items of the industry with comparative tables subjoined:—

Acetate of Lime.

In the first quarter of the year which is under review, 1917, prices for acetate of lime, while steady, continued to reflect the apathy of the trade so to speak, which had been noted at the close of the previous year, and there was no quotable alteration in the figures which had been prevailing from well back into the previous fall. But in April a better demand set in, and as stocks were not abundant, prices were advanced rather sharply to a new level which prevailed for the second quarter of the year. At the half-year mark there came another upward revision in quotations, and in the first week of September a third increase in quotations brought prices to a level which represented an increase in the highest price of just .843 per cent. above the lowest figure which had prevailed in the first month of the year. Throughout the last three months of the year prices were almost entirely nominal, as manufacturers found themselves just about able to keep their production abreast of the needs of old customers and urgent new business. Added to this came the requisitioning by the government of all production other than that which was released under special permit. The latter action served to practically wipe out all spot business in this chemical in the closing weeks of December, and the year ended with decided strength. Based on the final quotations of each week, the following table gives the high and low for each month of 1917, as well as similar quotations back to January, 1914:—

	1914.		1915.		1916.		1917.	
	H.	L.	H.	L.	H.	L.	H.	L.
Jan.....	1.80	1.75	2.05	2.00	7.05	6.00	3.55	3.50
Feb.....	1.80	1.75	2.05	2.00	7.05	7.00	3.55	3.50
March..	1.55	1.50	2.05	2.00	7.05	7.00	3.55	3.50
April...	1.55	1.50	2.56	2.50	7.05	7.00	4.55	4.50
May...	1.55	1.50	3.05	2.50	7.05	7.00	4.55	4.50
June...	1.55	1.50	3.55	3.50	7.05	7.00	4.55	4.50
July...	1.55	1.50	3.55	3.50	7.05	7.00	6.30	5.25
Aug...	1.55	1.50	3.80	3.75	7.05	7.00	5.30	5.25
Sept....	1.55	1.50	4.05	4.00	5.05	3.50	6.05	5.25
Oct.....	1.55	1.50	4.55	4.00	3.55	3.50	6.05	6.00
Nov.....	1.80	1.75	5.10	4.50	3.55	3.50	6.05	6.00
Dec.....	2.05	2.00	6.10	5.00	3.55	3.50	6.05	6.00
Year...	2.05	1.50	6.10	2.00	7.05	3.50	6.05	3.50

Arsenic.

Until the closing month of 1917 the market for arsenic was decidedly strong, and while there were periods in which recessions were made in the price levels, the ruling figures did not at any time decline sharply. The lowest figure prevailing for the white arsenic in 1917 was but ¼c. less than the highest figure for the previous year, and the highest quotation in the year which has just ended was within a fraction of being 250 per cent. higher than 1916's top quotation. The situation in this chemical was predominantly strong throughout the year, with the exception of the last three or four weeks of the year, when there was a slight weakening due to the fact that the government placed arsenic on the so-called conservation list, making it necessary to obtain licenses for all export shipments. These licenses were difficult to obtain, and stocks showed a slight accumulation when domestic interest slackened slightly. Throughout the summer and fall months insecticide interests complained frequently of their inability to obtain adequate supplies, and it was largely through their efforts that the government action was taken. The record high price of 20c. ruled during May, June and July, representing nearly 800 per cent. over the inside price prevailing at the outbreak of the war in Europe. Comparative figures are given below for each month of the last four years,

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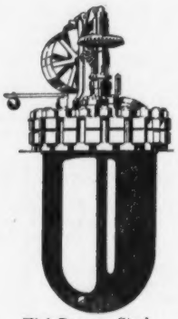

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based upon the week-end price per pound for white arsenic:—

	1914.		1915.		1916.		1917.	
	H.	L.	H.	L.	H.	L.	H.	L.
Jan....	2⅞	2⅞	4	4	5¼	3¾	9¾	8
Feb....	3⅛	3	4	4	6½	5¼	12	10½
March..	3⅛	3	4	4	6¼	6½	17	12½
April..	3	3	4	4	6¼	6½	18	17
May....	3	3	4	4	6½	6¼	20	17
June...	3	3	3¾	3¾	6½	6½	20	18
July....	3	2.80	3¾	3½	6½	6	20	17
Aug....	5	2.80	3¾	3¾	6¼	6	18½	16
Sept....	5	5	3¾	3½	6¼	5¾	18½	16
Oct....	5	5	3½	3½	6¼	6	18	16
Nov....	5	5	3½	3½	7⅛	6¼	18	16
Dec....	4½	3⅞	4½	3½	8¼	8	18	16½
Year...	5	2⅞	4½	3½	8¼	3⅞	20	8

Barium Chloride.

With practically no foreign goods arriving in this country, domestic producers of barium nitrate were required to care for the entire demand of the nation in the year which has just closed, and while production was largely increased, causing prices to drop from the high levels they had assumed in the previous year, all quotations were relatively firm. Entrance of an inferior grade of barium chloride in the market gave prices a wide range in the latter months of 1917, but the high-grade material showed little fluctuation. In the following will be found the average high and low prices for each month of 1917, as well as for 1915 and 1916, all representing quotations per ton based on the final prices each week:—

	1915		1916		1917	
	High.	Low.	High.	Low.	High.	Low.
Jan...	50.00	50.00	110.00	110.00	105.00	95.00
Feb...	50.00	50.00	140.00	130.00	100.00	90.00
March	50.00	50.00	140.00	140.00	100.00	90.00
April.	65.00	60.00	140.00	140.00	100.00	90.00
May..	67.50	60.00	140.00	130.00	100.00	90.00
June..	70.00	67.50	130.00	110.00	95.00	85.00
July..	100.00	70.00	125.00	105.00	95.00	85.00
Aug..	110.00	100.00	110.00	100.00	95.00	80.00
Sept..	100.00	95.00	110.00	100.00	90.00	80.00
Oct...	100.00	85.00	110.00	100.00	90.00	80.00
Nov..	115.00	90.00	110.00	100.00	90.00	80.00
Dec...	115.00	100.00	100.00	95.00	100.00	65.00
Year..	115.00	50.00	140.00	95.00	105.00	65.00

Bicarbonate of Soda.

Comparison of the subjoined table will show that prices for bicarbonate of soda have risen steadily throughout the past two years, for which the average high and low monthly figures are given. From the lowest figure quoted by manufacturers for their goods at the works in barrels in January, 1917, which was $1.75 per hundred pounds, to the highest figure named for the year, which was $2.75 in December, a net gain of $1 was scored. Several factors contributed to the firmness and underlying strength which characterized this market throughout the year. Chief among them was the continued steady demand of good proportions which served to keep manufacturers from acquiring any surplus stocks, which might have weakened the market. In addition, the strong position of soda ash right up to near the close of the year served to keep manufacturing costs relatively high. The following table, based on the week-end prices on a pound basis in barrels, gives the high and low quotations ruling each month for the last two years:—

	1916		1917	
	High.	Low.	High.	Low.
January	1.50	1.20	1.90	1.75
February	1.60	1.50	1.90	1.75
March	1.65	1.60	1.90	1.75
April	1.65	1.65	2.00	1.75
May	1.65	1.60	2.25	1.90
June	1.65	1.60	2.50	2.00
July	1.65	1.65	2.50	2.25
August	1.65	1.65	2.65	2.25
September	1.65	1.65	2.65	2.50
October	1.65	1.65	2.75	2.50
November	1.65	1.65	2.75	2.50
December	1.75	1.65	2.75	2.25
Year	1.75	1.20	2.75	1.75

Bleaching Powder.

As the year 1917 came to a close the market for bleaching powder showed signs of once again mounting to the high levels it had reached in 1916, and all producers were optimistic on the future because of the government having started the systematic commandeering of fully two-thirds of the country's output of this product. In the first quarter of 1917 prices were at the highest point of the 12 months under review, and from thence to July they gradually weakened until the low point of the year was reached under lack of demand and keen competition. Throughout the summer and well into the fall prices were easy, and occasionally sales were reported as low as ¾c. per pound; the usual seasonal stiffening of the market failed to set in and producers and second hands were dubious as to the future, and exports of the commodity were suddenly prohibited by the authorities at Washington. With the first week of December it became abruptly known that immense quantities of bleach were going to be needed by the government for the use of the Signal Corps and other war purposes. Then came reports of the government's seizing supplies, and next practically all manufacturers dropped from the market for spot business. Prices started upward, and predictions at this writing are that the 1916 high level will be reached again in 1918 unless the government steps in and regulates them. High and low prices for each month of the past four years are to be found in the subjoined table, the figures being for pounds, based on the current prices at the close of each week:—

	1915		1916		1917	
	H.	L.	H.	L.	H.	L.
January	1.37½	1.30	14	13	6½	4¼
February	1.37½	1.30	14	9½	6¼	4
March	1.37½	1.30	10½	8	6	3.60
April	1.40	1.40	8½	8	6	3¾
May	1.40	1.30	8½	6	5¼	3
June	1.37½	1.37½	8	6	4	2½
July	1.40	1.37½	8	4¾	4	1½
August	2.00	1.50	6½	4¼	3	1¼
September	2.50	1.75	6	4¼	2½	2
October	4.50	2.50	6	4½	4	2
November	6.00	4.00	6¼	4¾	3	1.35
December	11.00	6.00	6¼	4¼	3½	1¼
Year	11.00	1.30	14	4¼	6½	1¼

Blue Vitriol.

The range of prices for large blue vitriol crystals, 99 per cent, throughout the year 1917 was not subjected to any violent changes such as occurred in some months of the previous year. Firmness was apparent for the entire 12 months and at times there were exhibitions of strength when the demand for copper sulphate for export was unusually heavy. This was toward the close of the year, but prices were not changed. Highest prices for this commodity prevailed in January, and from that month up to September quotations were shaded gradually to a point where they became stable and manufacturers refused to make further reductions. The gradual lowering of quotations by the producers had the effect of forcing out second hands, many of whom purchased at figures considerably higher than the level to which prices later were reduced. At no time, however, did prices drop to the low level of the previous year, though 8½c. per pound was reached in September and October, being ½c. higher than 1916's bottom quotation. Comparisons may be obtained from the following table, which gives the high and low for the monthly periods of the year, based on the weekly ranges on a pound basis:—

	1914.		1915.		1916.		1917.	
	H.	L.	H.	L.	H.	L.	H.	L.
Jan.	4.84	4.80	4.55	4.35	23	14½	14	12
Feb.	4.80	4.80	4.55	4.35	23	20	12	10
Mar.	4.80	4.80	4.53	4.35	21	17	10	9
Apr.	4.80	4.80	6.75	6.00	20	17	10	9½
May	4.80	4.65	7.00	6.75	20	14½	10	9½
June	4.65	4.65	7.25	7.00	15	9	10	9½
July	4.65	4.50	7.25	7.25	10	8	10	9½
Aug.	4.50	4.50	7.25	7.25	10	8	10	9
Sept.	4.50	4.50	7.25	7.25	10¼	8½	9¼	8½
Oct..	4.50	4.35	7.00	6.50	12¼	10	9½	8½
Nov.	4.35	4.35	7.25	6.50	14	12½	10	9½
Dec.	4.35	4.35	13.00	7.00	23	8	10	9½
Year	4.80	4.35	13.00	4.35	23	8	14	8½

Brimstone.

Virtually from the beginning of the year 1917 until the end of the twelve-month period, the market for brimstone was a nominal one with consumers clamoring for supplies which they were unable to obtain as they wished. Movement of the product from the mines to consuming points continued to be hampered seriously by the tangle-up transportation situation which had existed in the preceding year, and when the United States entered the war in April the situation became worse, if that were possible. Demand for the mineral for war purposes which had been abnormally heavy now became fully double, and the producers who had been exerting their best efforts to meet the situation were forced to further and what seemed to be almost impossible endeavors.

Along toward the middle of the year, it became necessary for the government's War Industries Board to regulate the movement of the product with priority orders, and from that time to the end of the year all movement of the element was thus made, railroad shipments being made under licenses from that body. The movement was good but not equal to the urgent demand, and reports were frequently heard of at least one large producer in Louisiana being at one time as much as 25,000 tons behind in shipments. Prices were wholly nominal, new business at the mines being quoted practically throughout the year at $30 per ton, and spot prices ruling steadily from $35 to $45 per ton, though considerable business was done throughout the period at considerably under the inside figure because of outstanding contracts with old consumers.

Because of the enormous demand a large new company was organized by Louisiana interests to exploit large deposits of sulphur in New Mexico, but this concern was not in the producing field at the turn of the year, though those behind it predicted that they would be able to ship at the rate of 2,000 tons per day when active operations had started.

Caustic Potash.

While prices for caustic potash, 88 and 92 per cent. during 1917 at no time touched the highest figure reached in the previous year, though they were within five points of it at the start of the year, the lowest figure for the twelve months was 20 points over the botton quotation in 1916. Fluctuations were within narrow range as compared with the relatively violent changes in 1915, the outside or high figure each month being at no time varied more than 10 points, while the change in the low quotation was never greater than 3½ points. Throughout the tone was strong, due primarily to the continued scantiness of stocks and the never-ending strength of the muriate quality of potash, imports of the latter being absolutely cut off, while production here was negligible. Based on the closing quotations each week, the following table gives comparative high and low figures for each month of the last three years, prices being per pound:—

	1915		1916		1917	
	H.	L.	H.	L.	H.	L.
January ..	9	8	70	63	95	86
February ..	9	8	1.00	95	90	86
March	9	8	1.00	95	90	86
April	25	20	1.00	90	90	86
May	23	23	1.00	85	90	86
June	38	30	95	84	89	84
July	40	40	90	86	88	84
August	39	38	90	85	90	84
September .	39	38	90	85	90	85
October ...	40	39	90	83	85	82½
November .	60	41	95	85	90	83
December .	60	60	95	87	85	82½
Year	60	8	1.00	62	95	82½

Caustic Soda.

Though prices for the solid 76 and 78 per cent. quality of caustic soda reached what were thought to be spectacular levels in 1916, the topmost figure reached in that period was lower than the high record for the year under review, 1917. Prices had receded at the tail end of 1916 and continued at the low levels thoughout the first quarter of 1917. Better buying stimulated prices from that point, and, with a considerable increase in orders from foreign sources, coupled with a heavier domestic demand following the entrance of the United States into the war, quotations began an upward tendency, which continued practically unabated to the close of the year, the strong technical position of the market being accentuated when exports of the commodity were prohibited by the government and then followed by the government stepping into the market and systematically withdrawing huge amounts of the soda from manufacturers, who were, in turn, generally forced to refuse to participate in the spot market, leaving prompt business almost solely in the hands of brokers and dealers, who started to manipulate the market. This resulted in a slight recession in prices within a few weeks of the end of the year and the termination of the twelve months saw prices for spot deliveries showing a decidedly softer tendency. Comparison is given in the table below of the high and low prices in the spot market for each month of 1916 and 1917, based upon the quotations per pound prevailing at the close of each week:—

	1916		1917	
	High.	Low.	High.	Low.
January	6	5½	4¾	4¼
February	6½	6	4½	4¼
March	6¼	6	4½	4¼
April	6	5¾	5¼	4¼
May	6	5	6¼	5¾
June	5¼	4½	6¾	6¼
July	5	3½	7¼	6¾
August	4	3½	9¼	7.20
September	4½	3½	10½	9
October	4¼	4	8¾	7¾
November	5	4¼	8¼	7¾
December	4¾	4½	8¼	6½
Year	6½	3½	10½	4¼

The Chlorates.

Until well into the middle of the year the markets for the chlorates maintained their appearance of underlying strength, and the high price ranges which had ruled during the previous year were still prevailing for both the potash and soda qualities. In July, however, the quotations for soda chlorate on the spot eased off slightly, though the potash quality continued at the higher ranges until near the end of September. Scarcity of spot stocks and an active demand had served to keep the market tone for each very firm. Resale lots began then to make their appearance and simultaneously there came into the market considerable quantities of Japanese chlorate of potash. This competition in that material caused price reductions. But the soda material eased off when the demand fell below what it had previously been. Strength again became apparent in both of the markets as December approached and while prices did not advance materially, they were very tightly held, this being particularly true as to the soda quality. The appended tables give the average high and low prices which prevailed monthly during the last two years for each chlorate, taken from the quotations per pound ruling at the end of each week:—

Chlorate of Potash.

	1916		1917	
	High.	Low.	High.	Low.
January	50	45	70	64
February	65	50	70	63
March	75	65	70	60
April	75	75	70	58
May	75	70	75	66
June	70	53	75	55
July	70	47	75	51
August	70	45	75	55
September	70	51	75	55
October	70	60	60	50
November	70	67	55	49
December	70	66	54	40
Year	75	45	75	40

Chlorate of Soda.

	1916		1917	
	High.	Low.	High.	Low.
January	25	25	35	26
February	35	25	35	25
March	35	35	27	24
April	35	35	30	24
May	35	35	28	25
June	35	35	26	24
July	35	27	26	23
August	35	30	25	23
September	35	28	25	24
October	35	28	25	22
November	35	27	25½	23
December	35	26	25½	24
Year	35	25	35	23

Sal Soda.

Without quotable change in prices the market for sal soda continued to reflect a relatively firm tone on a good demand of a steady character for the first ten months of the year. Output by the producers was steadily absorbed and there was at no time any considerable surplus of stocks to be found in the spot market and second hands were generally absent from the trading. When November set in supplies had become rather scarce and prices advanced, but they receded in the following month, though retaining a portion of the gain, and the year closed with the market in a comparatively strong position. High and low prices per hundred pounds for each month are given herewith, computed from the prevailing figures at the close of each week in 1916 and 1917. The figures are:—

	1916		1917	
	High.	Low.	High.	Low.
January	$1.00	$0.85	$1.25	$1.10
February	1.10	1.00	1.25	1.10
March	1.25	1.10	1.25	1.10
April	1.50	1.25	1.25	1.10
May	1.50	1.25	1.25	1.10
June	1.25	1.00	1.25	1.10
July	1.15	1.00	1.25	1.10
August	1.15	1.00	1.25	1.10
September	1.15	1.00	1.25	1.10
October	1.15	1.00	1.25	1.10
November	1.15	1.10	1.25	1.15
December	1.10	1.10	1.35	1.15
Year	1.50	.85	1.35	1.10

Soda Ash (Light 58%).

Unsettled conditions and irregular prices prevailed throughout the year 1917 in the market for the light 58 per cent. quality of soda ash. This was principally due to the continued appearance in the market of second hands who sought to manipulate things by pressing offers at times and by creating talk of growing scarcity of stocks at other times. Producers were quickly booked up with contracts and were seldom found on the spot position. Highest prices for the year were touched and sustained throughout September. From the start of the year and up to that month quotations were generally lower than the average maintained throughout the previous year. While the topmost figure reached during the year was slightly under that of the previous twelve months the lowest price for 1917 was one full point higher than that of 1916. In the following compilation will be found the high and low prices for each month of 1916 and 1917 on a pound basis from the weekly price ranges:—

	1916		1917	
	High.	Low.	High.	Low.
January	4¼	1¾	3⅛	2¾
February	4¼	4	3	2⅞
March	4½	3¼	3.15	2.90
April	3½	2⅝	3.25	3.05
May	3¼	2¾	3.40	2.80
June	3	2¾	3.25	2.65
July	3	2¾	3.05	2.75
August	3½	3	4.10	2.85
September	3½	3	4.25	4.00
October	3½	3	3.80	3.10
November	3¼	3¼	3.50	2.85
December	3½	3.05	3.20	2.75
Year	4½	1¾	4¼	2.65

Saltpeter (Refined).

High producing costs served to keep prices of refined saltpeter at or near the high levels reached in the previous year throughout 1917, and the steady call for the commodity prevented anything like decided fluctuations in the quotations. At the opening of the year the quotations while about on a par with those in the preceeding twelve months showed signs of receding. This was due to a feeling that figures were too high, rather than because of any less firmness to the tone. Views of consumers were taken into consideration, more or less, and a range established which thereafter prevailed without appreciable change, though they averaged three to six times the figures which had prevailed in 1914. The following shows the high and low prices each month based on the weekly figures for the past three years per pound:—

	1915		1916		1917	
	H.	L.	H.	L.	H.	L.
Jan	8	7	38	35	35	31
Feb	8	7	38	35	35	31
March ...	8	7	38	35	38	31
April	12¼	12	36½	35	38	31
May	12¼	12¼	36½	35	38	31
June	15	12¼	36½	29¾	38	31
July	17	17	30¾	25	38	31
Aug.	18	18	25	25	38	31
Sept.	18	18	32	25	32	25
Oct.	18	18	32	31	33	28
Nov.	38	18	33	31	31½	28
Dec.	38	35	35	31	31½	28
Year	38	7	38	25	38	28

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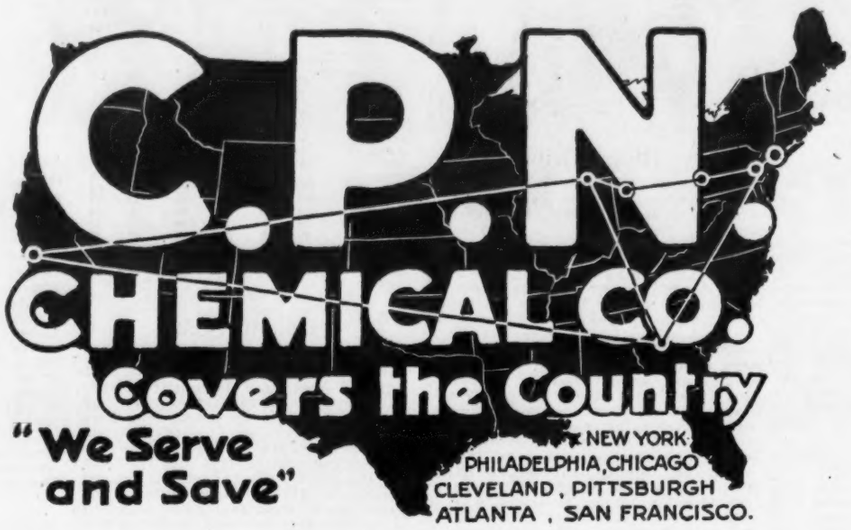

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ACIDS.

Acetic Acid.

The lowest prices for acetic acid during the year 1917 prevailed in the months of February and March, though they at no time were less than double those which had prevailed prior to the outbreak of the war in Europe in 1914. Higher production costs offset a slump in the active demand which had characterized the trading in 1916. The lower ranges prevailed but temporarily, it might be stated, as with the approach of summer a very large and urgent export business appeared in the market, chiefly from South American nations, and this kept producers at capacity, and by the middle of September prices were at their highest for the year. The market took a turn downward thereafter, though the declines were gradual, and by the middle of October prices seemed to steady, at a level which was, however, considerably higher than that which had prevailed at the opening of the year. As the year approached its end the market showed signs of easing under a prohibition of exports to Southern Latin republics, except under special license. Prices were kept from a sharp drop only by the fact that producing costs were even higher than at the opening of the year. In the following table will be found the high and low prices for 28 per cent. acid each month of 1915, 1916 and 1917, based upon the quotations per pound each week:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
Jan.	1⅝	1⅜	10	6	5	3½
Feb.	1⅜	1⅜	10	6	4½	3½
March	1⅜	1⅜	10	8½	4½	3½
April	2	1⅜	8½	7¼	5	4½
May	2	2	7¼	5¼	5	..
June	2½	2	6¾	5¼	6	5
July	2⅝	2½	6	5¾	6	5
Aug.	2¾	2⅝	6	5	7⅛	5¼
Sept.	3	3	5	3½	7⅛	7
Oct.	3¼	3	4	3½	7½	6¼
Nov.	5	3¼	4	3½	7	5½
Dec.	7	3¾	5	4	7	5½
Year	7	1¾	10	3½	7⅛	3½

Muriatic Acid (22 Degrees).

For the first four months of 1917 prices for 22-degree muriatic acid ruled steadily at the levels which had prevailed over the turn of the previous year and the tone of the market was firm, with the dye makers and color producers continuing the predominant element in the trading. Slackening in the demand brought about a price recession in the two succeeding months, but the previous levels were quickly restored in the summer, when activity was largely renewed, and this condition continued until the close of the year, with the market in a strong technical position on a very active demand and production costs high, owing to the strong position of the basic materials. Shortage of carboys, which were held at unusually high figures, was a feature of this market in the last months of the year. Prices are contained in the subjoined table, showing the high and low figures each month in 1916 and 1917, taken from the weekly quotations per pound:—

	1916 H.	1916 L.	1917 H.	1917 L.
January	3½	2¼	2¼	2
February	3½	3	2¼	2
March	3½	3	2¼	2
April	3½	3	2¼	1¾
May	4	3	2	1¾
June	5	3½	2¼	1¾
July	4	3½	2¼	2
August	3½	2½	2¼	2
September	2½	2¼	2¼	2
October	2½	2¼	3¼	2¼
November	2½	2¼	3	2¼
December	2¼	2	2½	2¼
Year	5½	2	3¼	1¾

Nitric Acid.

Increased production making offers more free, the market for nitric acid had an easy appearance throughout the first quarter of 1917, but with the declaration of war by the United States and the subsequent speeding up in the making of explosives for our army's consumption, the demand for this acid became enormous and the market almost immediately became a nominal one. Prices started upward, and from the last week in March until the first week in November prices for the scattered lots which were available from time to time in the spot market gradually worked higher. Leading producers withdrew from the spot market and in many cases refused to quote on contract business, also finding themselves tied up with government work. This condition ruled until the end of the year, and indications pointed to the continuance of the situation throughput the coming 12 months. In the following table will be found the high and low prices for the 42-degree acid for each month of the last two years on a pound basis, taken from the weekly closing figures:—

	1916 H.	1916 L.	1917 H.	1917 L.
January	9¼	8¼	6½	6¼
February	9¼	8¼	6½	6¼
March	9¼	8½	8	6¼
April	9¼	8½	8¼	7
May	9¼	8¼	8¼	7
June	8¼	8	8	7½
July	8¼	8	8½	8
August	8	7¼	8½	8¼
September	7½	7	8½	8¼
October	7½	6½	10½	8¼
November	6¾	6½	10½	9
December	6½	6	9½	8½
Year	9¼	6	10½	6¼

Oxalic Acid.

Only seven points separated the highest from the lowest price obtained in the market for oxalic acid during the year 1917, and at no time was the range between the outside and the inside figures at the close of a week greater than three points. This is in contrast to a variance of thirty-three points noticeable between the high and the low prices in 1916. It shows that, while prices were considerable lower than the sensational figures of 1916, they were more stable. Throughout the year this market ruled relatively firmer than during the previous year. While at times the demand slackened, the absence of anything like large stocks on the spot prevented sharp drops in price. As the year closed the market showed signs of increasing firmness. The table below contains the monthly high and low figures for the two years compared, representing prices per pound and taken from the closing quotations each week:—

	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
Jan.	13	12½	60	50	50	43
Feb.	13	12½	64	60	48	43
March	13	12½	80	64	48	46
April	19	18	80	75	47	44
May	19	19	75	71	47	45
June	24	19	72	65	47½	46
July	30	25	66	58	47	46½
August	40½	35	61	58	47	45½
Sept.	44½	40	62	60	49	45½
Oct.	48	41	62	57	49	45
Nov.	51	50	59	54	48	43
Dec.	51	50	54	47	46	45
Year	51	12½	80	47	50	43

Sulphuric Acid.

While the production of sulphuric acid in the year 1916 was more than 15 per cent. greater than it had been in the previous year, the output of this chemical in the year which has just closed was increased considerably more than one-third again, or over 39 per cent., taking the estimated total for the year as a basis. Manufacturers and government officials figured that the production of sulphuric acid in 1917 was slightly in excess of 6,250,000 tons reduced to a basis of 50-degree acid.

Manufacturers of the acid who were practically producing at the capacity of their plants prior to the entrance of the United States into the war in April found themselves face to face with the gigantic problem of supplying even greater production than heretofore. They extended their work, but the apparently insatiable demands of the government and very heavy calls from private consumers absorbed the acid as fast as it was turned out, with the result that in a very brief time the market became a nominal affair entirely. While manufacturers continued to quote the 66-degree acid for the first quarter of the year on the same basis as they had been doing in the last quarter of 1917, their hands were gradually forced until in October the highest price of the year was reached, though it was just the same as the high for 1916. About this time reports were received from time to time of odd lots of the acid being sold by second hands at prices considerably higher than the market range. Soon after this practically all manufacturers withdrew from the market and would thereafter accept orders for business only after ostensible buyers had shown that their business had been approved by the government as one that should obtain needed supplies. In addition, the government commandeered large quantities of the acid. This condition existed with the close of the year, and it was estimated by experts that the requirements of the government in 1918 would reach 1,000,000 tons and possibly 1,500,000 of 66-degree acid. It was figured that the country's output in the coming year will total over 8,000,000 tons reduced to a 50-degree basis.

In the following will be found the high and low prices prevailing each month for the last two years, compiled from the closing prices per pound each week:—

	1916 H.	1916 L.	1917 H.	1917 L.
January	3	2	2	1½
February	3	2½	2	1½
March	3	2½	2¼	1⅝
April	3	2½	2¼	1⅝
May	3	2½	2¼	1½
June	3	2¼	2¼	1½
July	2¼	1½	2¼	1½
August	2	1½	2¼	1⅝
September	2	1½	2¼	1⅝
October	2	1½	3	1⅝
November	2	1½	3	1⅝
December	2	1½	3	2
Year	3	1½	3	1½

Tartaric Acid.

Export business was an exceptionally large factor in the market for tartaric acid in the year under review. Lowest prices for the crystals prevailed in January and the first week of February, but from that point on quotations show a gradual and steady upward movement up to the middle of July, where the advance reached its zenith. Slight recessions occurred thereafter, but the losses were recovered within the next two months and from October until the close of the year all quotations were firmly held with spot goods in none too plentiful supply in the face of a steady demand of good proportions. Appended hereto will be found the highest and lowest prices for tartaric acid crystals per pound which prevailed each month during 1914, 1915, 1916 and last year. They are taken from the closing figures each week and are as follows:—

	1914 H.	1914 L.	1915 H.	1915 L.	1916 H.	1916 L.	1917 H.	1917 L.
Jan.	31½	31½	40¾	37½	62	52	70	66
Feb.	31½	31½	40¾	37½	70	55	78	66
March	31½	30½	40¾	37½	77	66	84	75
April	30½	30¼	39	38	85	66	82	76
May	30¼	30¼	40¼	39	79	66	80	76
June	30¼	30¼	48	48	75	66	80	78½
July	30¼	30¼	48	44	72	66	82	78½
Aug.	75	30¼	46½	46½	70	66	81	78½
Sept.	80	70	46½	46½	70	66	81	78½
Oct.	55	50	47	46½	70	66	81	78½
Nov.	48	42¾	52	47	70	66	81	78½
Dec.	44	40¾	55	49	70	66	78½	76
Year	80	30¼	55	37½	85	52	84	66

London Chemical Market in 1917 and Price Review.

Following is a summary of prices in London of some of the leading items of the heavy chemical classification as at the beginning and the end of 1917 and at the close of the intermediate quarters. In the main, they show higher values at the finish than at starting, representing thereby increased cost of production, though dearer rates, for raw material and reagents and higher labor charges The number of government-controlled chemicals (actually or virtually) shows an increase, so that "proper" quotations are more or less nominal and actual business a matter of negotiation. Other items are nominal by virtue of scarcity. Hence those articles which can usefully be brought into review are limited, but the table herewith will serve as indicative of the general trend:—

	Jan. £	Jan. s.	Jan. d.	March £	March s.	March d.	June £	June s.	June d.	Sept. £	Sept. s.	Sept. d.	Dec. £	Dec. s.	Dec. d.
Alum, lump, ton	22	10	0	20	0	0	22	0	0	20	0	0	21	0	0
Ammon. carb., lump, lb.	0	0	6½	0	0	6½	0	0	6½	0	0	6½	0	0	7½
†Ammon. sulph., ton	17	10	0	15	10	0	15	10	0	15	7	6	15	15	0
Arsenic, Cornish, white, ton	45	0	0	60	0	0	90	0	0	110	0	0	150	0	0
Benzoic acid, lb.	0	25	0	0	22	6	0	27	0	0	17	0	0	16	0
Bleaching powder, ton	33	0	0	33	0	0	33	0	0	25	0	0	20	0	0
										nominal.			nominal.		
Boracic acid, pdr., cwt.	2	17	0	3	4	0	3	4	0	3	4	0	3	4	0
Borax, pdr., cwt.	1	14	0	1	18	0	1	18	0	1	18	0	1	18	0
†Carbolic acid, crude, gal.	0	3	4	0	3	4	0	3	4	0	3	4	0	3	4
Carbolic acid, 39 deg., cryst., lb.	0	1	3	0	1	3	0	1	3	0	1	3	0	1	3
Citric acid, lb.	0	2	7½	0	3	4	0	3	4½	0	3	3	0	3	2½
Copper sulphate, export, ton	65	0	0	61	0	0	62	0	0	62	0	0	67	10	0
Cream of tartar, 98 p. c., cwt.	9	5	0	9	17	6	12	0	0	14	10	0	17	7	6
Oxalic acid, lb.	0	1	6	0	1	6	0	1	6	0	1	6	0	1	7
†Potash, Montreal, firsts, cwt.	9	0	0	9	0	0	10	0	0	10	5	0	10	10	0
†Potash, caustic, 88-90, ton	305	0	0	305	0	0	350	0	0	350	0	0	0	nominal.	
Potass., acetate, lb.	0	3	7	0	3	7	0	3	7	0	3	7	0	3	8
Potass., bichromate, lb.	0	1	6	0	1	5½	0	1	5	0	2	0	0	2	6
†Potass., carb., 90-92 p. c., ton	120	0	0	120	0	0	110	0	0	115	0	0	0	nominal.	
Potass., chlorate, lb.	0	2	6	0	2	6	0	2	5	0	2	5	0	2	5
Potass., permanganate, lb.	0	11	0	0	12	0	0	13	0	0	13	6	0	15	0
Potass., prussiate, lb.	0	4	0	0	3	10	0	3	5	0	3	3	0	3	6
Quicksilver, bottle	18	10	0	20	0	0	25	0	0	20	0	0	25	0	0
										nominal.					
Salammoniac, 1st crushed, cwt.	3	12	0	3	12	0	3	12	0	3	12	0	4	0	0
Saltpeter, Eng., ref., cwt.	3	7	0	3	8	0	3	5	0	3	5	0	3	5	0
Soda caustic, 70 p. c., ton	32	10	0	32	10	0	30	0	0	25	10	0	24	10	0
Sodium bicarb., ton	8	10	0	8	10	0	8	10	0	9	0	0	9	10	0
Sodium, hyposulph (P), ton	15	0	0	19	0	0	22	0	0	24	0	0	35	0	0
Sodium nit., ref., ton	20	5	0	22	15	0	26	0	0	26	0	0	27	5	0
Sodium sulphate, ton	7	0	0	7	0	0	7	0	0	7	0	0	10	10	0
Sulphur flowers, ton	20	0	0	37	10	0	36	0	0	32	0	0	32	0	0
Sulphur, roll	19	0	0	35	0	0	30	0	0	30	0	0	30	0	0
Tartaric acid, lb.	0	2	7	0	2	9½	0	3	1	0	2	10¼	0	3	1

† Controlled.

COAL-TAR DYE AND INTERMEDIATE SALES AND PRODUCTION INCREASED

Development of New Industry Following World War of Immense Benefit to United States—Large Production of Aniline Colors.

No achievement in the history of American manufacturing based upon scientific research has been greater than the progress which has been made in the short space of three and one-half years in the manufacture of aniline colors and coal-tar derivatives and intermediates in the United States. Prior to the outbreak of the war in Europe, in the summer of 1914, the manufacture of aniline dyes from coal-tar products was a negligible and inconsequential industry in this country, virtually all of the country's needs in that line being supplied from abroad. In fact, there were just five factories in the entire nation devoting their efforts to the making of aniline colors. Only one of them was turning out an intermediate product, namely, aniline oil.

At the close of the year 1917 more than 120 factories were engaged in the industry, and their output was not only sufficient to supply the entire needs of the country, but furnished a large surplus for export to foreign countries. Where the country had been importing some $10,000,000 worth of dyes annually before the war, it exported more than $12,500,000 worth of dyes in the first ten months of last year, according to the Bureau of Foreign and Domestic Commerce. Over $3,000,000 of these exports went to Great Britain. Meanwhile plans are going forward for the further enlargement of the industry, so that with the close of the present conflict of nations American manufacturers will be in a position to withstand any kind of competition in the markets of the world.

Giant Strides in 1917.

Taken in comparison with the progress made in the year 1917, the accomplishments in this industry in 1915 and 1916 may be termed mere memories, so great were the strides made in the production of coal-tar dyes and intermediates in the twelve months under review. Commendable progress was made in the first mentioned years along the lines of quantity of production, but, in addition to an even greater output, the year 1917 is notable for the improved quality of the output.

With the close of the past year American manufacturers were producing practically all of the intermediates used by the industry, the only exceptions being in the cases of a few specialties. During the year ideas were developed slowly and with painstaking thoroughness, the manufacturers being desirous of overcoming the hesitancy of consumers in purchasing domestic dyes. This hesitancy had been developed among consumers when they found that American-made colors could not be used as advantageously as those of foreign production. Therefore the larger manufacturers of this country devoted their efforts to turning out high-grade products, and their efforts were rewarded largely, the greater part of the consuming element finding by the end of the year that American manufacturers were at last producing practically everything that they had theretofore looked to German makers for.

A Formidable Problem.

This is a notable achievement, when it is recalled that, to place themselves in the position just mentioned, American manufacturers have had to conquer a formidable problem. Authorities point out that the industry requires more than 900 distinct chemical products, taken from about 300 different intermediates, which in turn are obtained from ten crude materials derived from the distillation of coal tar.

Capital invested in the industry has been increased constantly, and from a total of about $5,000,000, prior to the start of the war, it has grown until the aggregate today is around, if not more than, $300,000,000. That this total will be exceeded in the near future is readily conceded, as it is known that this branch of the chemical industry holds out glowing prospects for quick returns on the money invested, a fact which is always the primary consideration with investors of capital in a new industry. Thus sufficient capital seems to be assured for the carrying forward of the perfection and completion of all necessary experiments.

As stated before, there was but one factory in the country producing coal-tar intermediates before the start of the war in 1914, while at the present more than 120 factories are engaged in making intermediates or other coal-tar dye essentials. The one intermediate made in 1914 was aniline oil, and the quantity was very small, comparatively speaking. At the end of the last calendar year the production here of that single intermediate totaled millions of pounds. Likewise millions of pounds of other products were produced. While actual production figures are not available at this time, fairly accurate estimates of some of the products have been computed by those in the trade.

Benzol Heads the List.

Benzol, which is regarded as the most important item, heads the list in regard to estimated production. While it was figured that 30,000,000 gallons of the crude were produced in 1916, it is estimated that the aggregate for the year 1917 will be several million gallons greater than 1916. Similarly, the output of toluol for the year, it is estimated, will be much greater than the 8,000,000 gallons which were produced in 1916. Official figures are lacking for

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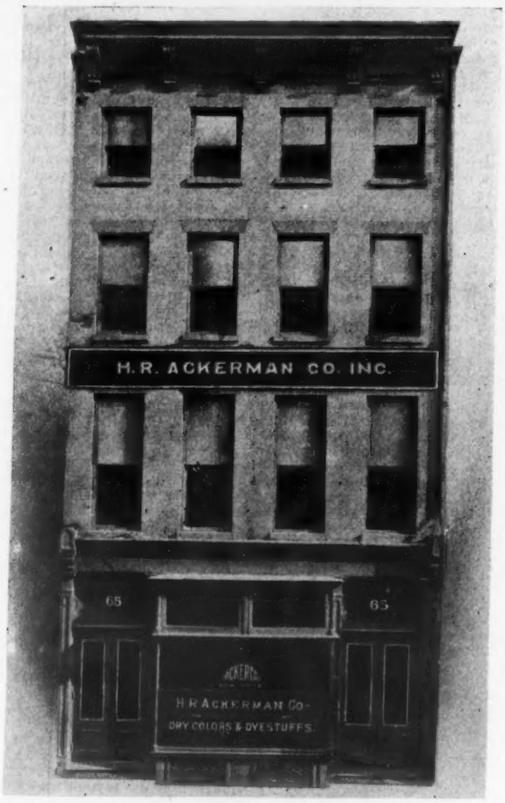

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this crude because of the great call for it for war purposes and the tremendous enlargement of production in a short period.

Production of naphthalene, which is largely produced because there is a great demand for it, shows a 100 per cent. increase. Where the output of this product in 1916 was estimated at 12,000 tons, it was approximately 25,000 tons in the last year. The consumption of this material is large throughout the entire country. It is in large demand, not alone for dye purposes, but for use as a moth preventive, being sold for such in great quantities all over the land. It has been figured that the consumption of this product in the United States was between 9,000,000 and 10,000,000 pounds annually, prior to the war, and of this amount one-third was imported from Germany and another third from Great Britain.

25,000 Tons of Phenol.

The output of phenol during the twelve months under review is estimated to have been around 25,000 tons, also, which compares with the estimated total of 12,500 tons in the previous twelve months of 1916. Prior to the war this coal-tar primary was not produced to any extent in this country, and was largely imported from Germany and England. The conflict cut off supplies, and as it is a product vitally needed in the making of picric acid, manufacturers turned their attention to its production on a large scale, but the entrance of the United States into the war quickly showed that further expansion in the making of this derivative was essential, and greater production soon became a reality.

Phenol was not alone in the great call for conversion of coal-tar products into explosives and other war essentials. A great many of the coal-tar intermediates are valuable adjuncts to the making of munitions. Among them might be mentioned benzol, aniline, naphthalene, nitrobenzol, dimethylaniline, monochlorbenzol, diphenylamine, dinitrochlorbenzol, dinitrophenol and dinitrotoluol. Producers of these intermediates extended their efforts largely during the year—that is, up to December, at least, when the coal shortage had an appreciable effect on their production.

Tremendous Exports.

In the matter of exports of surplus production some figures for the calendar year 1917 are available. They show that American exporters sent out of the country a total of 15,860,496 pounds of benzol, valued at $1,446,250, in the twelve months, while the aggregate exports of all other coal-tar distillates was $2,855,394. Outgoing shipments of aniline dyes were worth $3,502,218.

In the matter of imports, some interesting comparisons are given for the calendar years 1915, 1916 and 1917. American consumers and others imported a total of 2,055,790 pounds of phenol in 1915, with a value of $126,092, while the 1916 total was 1,871,343, worth $131,531. These figures compare with imports of 664,927 pounds, valued at $48,910, in 1917. Imports of alizarin and alizarin dyes in the three years show a steady decline, with the 1915 imports placed at 3,128,204 pounds, worth $827,992, against 45,124 ponnds, valued at $70,291, in 1916, and 21,629 pounds, aggregating $82,365, last year.

No imports of aniline salts were recorded during last year, while the 1916 total was only 20 pounds, with a total value of $4. compared with imports amounting to 261,097 pounds and valued at $65,319 in 1915. Miscellaneous colors and dyes brought into the country last year aggregated $2,750,708, while the 1916 imports totalled $4,420,147, and the 1915 amounted to $3,396,594.

Imports Fell Away.

The figures for imports of creosote oil are of interest, as they also show a falling off, and that fact is taken to indicate more reliance upon American producers by domestic consumers. The 1915 imports of this coal-tar derivative amounted to 34,442,028 gallons, having an aggregate value of $2,676,430, and in 1916 the total was 46,843,417 gallons, worth $3,528,098. Last year's imports dropped to 9,818,208 gallons, which were invoiced at $787,343.

Imports of synthetic indigo gained in the last year as compared with the previous twelve months. They were 1,411,998 pounds in 1917, with a value of $396,468, against 141,990 pounds, worth $121,250, in 1916. Imports of all other coal-tar distillates in 1915, 1916 and 1917 were valued at $447,634, $742,491 and $738,558, respectively.

Alizarin Blue Substitute.

In connection with the imports of synthetic indigo it is interesting to note that consumption by cotton mills of this artificial dyestuff fell off materially, according to a recent report of the Tariff Commission, in 1916, as compared with that of 1913. It was largely replaced by the natural or vegetable material. This falling off was noticeable in regard to almost all of the coal-tar dyestuffs excepting sulphur black and sulphur black which were produced in large quantities even in 1916. The increased production and activity of American manufactures of coal-tar products in 1917 largely overcame the condition existing in 1916, and in 1917 consumption of the products, it is estimated, was nearly equal to what it had been prior to the war.

Wool manufacturers, on the other hand, consumed more of certain coal-tar dyestuffs in 1916 than they did in 1913. This was notably true of alizarin blue, of which 869,695 pounds, worth $207,645, were consumed in 1913, against 2,656,676 pounds, valued at $1,541,085, used by 25 important wool manufacturers. This increase is explained as being due almost to a certainty to the use of a gallocyanine substitute of domestic production, as no true alizarin was being made in the country in 1916.

While great strides have been made in the development of coal-tar dye and intermediate production in this country up to the developing and producing on a satisfactory scale of vat dyes of the four classifications known as the indanthrenes, alizazrins proper, indigo series and carbazoles. Immense outlays of capital and an enormous amount of research and scientific work remain to be done in the perfecting of plans for the production of those series.

Need Organic Chemists.

Along the line of research work in the dyestuff industry it is interesting to note that Germany's success in the industry has been due to the fact that her chemists have devoted their efforts principally to the study of organic chemistry, while American chemists, it is pointed out, have neglected that field almost entirely heretofore. The dyestuff industry is organic chemistry. Most German chemists, after their graduation from college, seek positions in coal-tar plants, there being no mines in Germany and, therefore, less call for inorganic chemists generally. Universities in Germany make their principal courses organic chemistry and the shorter courses are for the study of the inorganic branch. In the United States it has been the reverse, this country having no dyestuff plants to speak of, but having large industries in every other line and calling for inorganic chemistry. American universities, therefore, devoted their efforts to the turning out of inorganic chemists to supply the demand for technical men for copper mines and refineries, iron works and other great inorganic industries.

Those who have studied the conditions, however, state that Americans have nevertheless found but little difficulty in mastering the science when they did take up organic and dyestuff chemistry in former years. They point out that one of the chief chemists in the largest dyestuff plant in Germany for a number of years was an American. These statements have been proven true, it seems, by the great progress which has already been made in the industry, now, that the United States has had to depend upon its own resources for its dyestuffs.

Not all the advance in the dyestuff industry has been confined to this country, it may be here stated. Notable progress has been made in Great Britain during the year which has just terminated. One of the principal features of the development of the industry in that country was the acquisition through goverment action of the German concerns in Great Britain by British capital. The close of the year found all activities in connection with dye-making in that country in the hands of British interests. The control of a big German plant enabled the firm taking it over to not alone supply all of the country's enormous demand for synthetic indigo, but to supply a great part of the needs of the world outside of enemy nations. Commendable progress has also been made in that country in the production of the greatly needed vat dyes, and while there is still a shortage of alizarine colors that condition is gradually being overcome by a British producer.

Swiss Dyestuffs.

The year has shown a wonderful development also in the dyestuff industry in Switzerland, where the disappearance of German competition as soon as hostilities commenced in Europe has allowed Switzerland to develop her own factories. The little nation responded to the opportunity with a vim that enabled her to reap enormous profits, as all of the world was virtually obliged to look to her for dyestuff supplies. In 1916 the profits made were enormous, but in this past year raw materials became scarcer and labor grew harder to obtain through the mobilization of the Swiss army. Fuel shortage was also felt, but the industry has been set on its feet, so to speak, in that country and will be capable of competing sharply with Germany at the close of the war.

Recent consular reports from Basel, Switzerland, show that during the year 1917 there was a total of 1,598,542 pounds of aniline colors, valued at $2,587,618, invoiced at the American consulate there for shipment to the United States. Invoices for artificial indigo filed at the consulate totaled 1,532,100 pounds, worth $1,048,226, in the same period.

Sweden has also turned her attention to the making of dyestuffs and within the year several large companies for the making of dyestuffs were organized by Swedish capitalists. One of the new concerns was formed after two and one-half years of experimental work, and it is the expectation of its founders that it will be able to compete sharply with the Germans both at home and aboard. Swedish needs as to dyestuffs are estimated to aggregate around 10,000 tons annually, and it is proposed by the Swedish firms to supply this first and then to turn their attention to foreign opportunities.

There has been, likewise, considerable progress made by Italian chemical interests in the dyestuffs field, but not of such character as to care for the needs of the country. There is revived, it is stated, a good field in that country for American dyes and during the year exports to that country are stated to have been fairly large. China also purchased considerable quantities of American dyestuffs and is an available market for the efforts of American manufacturers.

Aniline Oil Output.

In the past year American manufacturers produced aniline oil on a lavish scale, and the same was true of aniline salt. The output of oil was of a good quality and was favorably received by the trade, but prices were erratic because of the large production until late in the year, when manufacturers obtained better control of the market and conditions were more steady. Aniline salt was fairly steady in tone throughout the year and prices did not alter greatly at any time.

Early production of nitrobenzol was heavy, but several manufacturers discontinued making the intermediate later and prices became more steady, with the material being produced finding a ready outlet. This also applied to toluidine, of which there were about a half-dozen producers at the start and for the first six months of the war with only two producers in the market at the end of the twelve months.

Government needs soon after the entrance of this country into the war cleared out the spot market for picric acid and trinitrotoluol. Production of paranitrotoluol was large at the beginning of the year, but makers of this material also dwindled down in numbers toward the close of the year, giving more steadiness to the market and curtailing the output. Much the same conditions ruled in the market for orthonitrotoluol.

Requirements for the making of munitions had a sharp effect on the market for diphenylamine in the last quarter of the year and the spot market became virtually bare of stocks. Large quantities of dimethylaniline were produced, but there was a steady outlet for the material to dyemakers and prices were not materially altered during the year.

A better idea of the activities of the markets for the principal coal-tar crudes and intermediates follows. Tables are subjoined giving the average high and low prices prevailing each month, they being computed from the price per pound in the weekly spot markets:—

Alpha-Naphthylamine.

While competition was gradually increased during the year in the market for alpha-naphthylamine as new manufacturers entered the market with their product, the steady demand from dye-makers for this commodity served to sustain prices at high levels. This was so until about the end of the summer, when the call for supplies lessened and prices dropped. The lowest figures of the year prevailed in September and October. From then to the close of the year business was dull and prices low as compared with the fore part of the year, though the tone was steady in the main. In the following table will be found the high and low prices each month of the year based upon the quotations ruling at the close of each week:

High and Low Prices.

	1917	
	High.	Low.
January	$1.35	$1.25
February	1.30	1.25
March	....	1.25
April	1.25	1.15
May	1.25	1.00
June	1.25	1.00
July	....	1.00
August	1.00	.80
September	1.00	.63
October	.80	.63
November	.70	.65
December	.70	.65
Year	1.35	.63

Aniline.

In comparison the market for aniline salt was firmer throughout the year 1917 than was the market for aniline oil, though the latter maintained a relatively steady tone for the greater part of the period being reviewed. Prices for the salt likewise ruled higher and changes were less frequent and on a smaller scale as a whole. The oil showed signs in January of having overcome the weakness which had developed toward the close of the previous year and the improvement continued week by week until the end of June, when trading appeared to slacken and prices declined slightly. Further ease was noted under increased production and subsequent competition in the following month of July and this condition ruled through the trading in the succeeding months until about the first of November, when there was a more firm tone to the trading on a better business and less plentiful stocks of the oil. As the turn of the year approached the tone began to show more pronounced firmness under better consuming interest but prices were without quotable change. With regard to the salt quality it may be stated that the trading in this material, while slow at times in the early part of the year, picked up with the summer months, and as offers were not too freely made and supplies on the spot apparently lighter than they had been prices recorded an advance over the levels which had been ruling for several months. This advance was maintained by all sellers throughout the summer and up to the last part of October, when a slight decrease in the prevailing figures occurred on increased supplies. This condition ruled at the close of the year, with trading showing signs of picking up and prices indicating more stiffness in the future. In the following table will be found the highest and lowest price, based on the closing weekly quotations per pound for each month of the year for both the oil and salt aniline qualities:—

High and Low, Oil and Salt.

OIL.	1917		SALT.	1917	
	H.	L.		H.	L.
January	..	..	January	..	..
February	29	23	February	34	27
March	30	27	March	34	29
April	30	28	April	34	32
May	32	30	May	35	34
June	32	30	June	35	34
July	31	28	July	35	33
August	30	28	August	35	33
September	30	28	September	35	32
October	30	26½	October	35	33
November	28	26	November	34	31
December	30	25	December	34	33
Year	32	23	Year	35	27

Benzol.

For the first eight months of the year the market for benzol ruled just about steady, with prices in the open spot market showing no quotable change in range for that period. The tone was such that almost anything that might occur in the trading could have sent prices downward. This happened in October, when the levels which sellers had been endeavoring to maintain dropped through sheer apathy on the part of consumers and a rather large number of free offers. Competition became rather severe in this commodity and quotations were repeatedly shaded though the open spot market prices seemed to rule without change for several weeks thereafter, when a further reduction occurred. This was about the latter part of November. From that point on prices seemed to become unsteady and further recessions were apparently in order. The tangled-up situation in regard to transportation, however, served to aid many manufacturers in sustaining their prices and no declines were recorded, consumers being forced from time to time to come into the open market because of failure of contracted supplies to arrive because of railroad embargoes and simliar difficulties. While production figures for benzol are not available at this time, it is believed by authorities in the trade that the aggregate output of American manufacturers will exceed the 1916 production of 30,000,000 gallons by several million gallons. In the following table will be found the high and low prices prevailing for the pure benzol each month of the last two years, based on the weekly closing price per pound:—

High and Low.

	1916		1917	
	High.	Low.	High.	Low.
January	$0.80	$0.80	$0.60	$0.58
February	.80	.80	.60	.58
March	.90	.80	.60	.55
April	.90	.85	.60	.55
May	.80	.70	.60	.55
June	.80	.70	.60	.55
July	.80	.68	.60	.55
August	.68	.68	.60	.55
September	.68	.68	.60	.52½
October	.60	.60	.55	.50
November	.60	.60	.50	.45
December	.60	.60	.50	.45
Year	.90	.60	.60	.45

Beta-Naphthol.

Considerable irregularity was noticeable in the market for beta-naphthol throughout the past twelve months, if the year be taken as a whole. Showing a fairly steady tone, the market opened the year with trading in moderate volume, but sellers held varied views as to values and the range of figures obtained in the spot market for the sublimed commodity was a wide one. This condition existed alternately throughout the year, wide ranges prevailing for many weeks, only to be succeeded by a narrowing of the chasm between the high and low when stocks became less plentiful and a relative good demand existed. Highest figures of the year prevailed in January and February, and from the last named month quotations showed a gradual decline until the end of May. With the first week in June more firmness was evidenced in the attitude of buyers, and business picked up, with a subsequent

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advance on the part of the prices of some sellers, though the inside figure continued to be unaltered. July saw all sellers holding high ideals of values, and with the approach of September prices had worked back to a point considerably nearer the opening figures of the year. The tone continued to be unsettled and irregular until nearly the last week of the year, when more steadiness was exhibited on an improved demand and depletion of supplies. Added to this is a table showing the high and low prices per pound fo the sublime beta-naphthol each month of the year, base on the weekly quotations prevailing:

High and Low.

	1917	
	High.	Low.
January	1.05	.90
February	1.00	.90
March	.90	.85
April	.90	.75
May	.80	.75
June	.85	.75
July	.85	.80
August	.90	.75
September	.90	.75
October	.90	.85
November	.90	.85
December	.90	.85
Year	1.05	.75

Dinitronaphthaline.

Prices in the market for dinitronaphthaline worked downward from gradually throughout the year, showing their high point in the opening month and the lowest figure of the year in December. This was due primarily to the slow demand which was in evidence practically throughout the entire twelve months. There was little of especial interest to the trading at any period of the year, the market being mostly of a routine nature. As stocks increased under a slackening in the demand, prices slumped, though there was at no time a sharp drop, the downward movement being accomplished in an easy and smooth manner. In the following will be found a table of the high and low prices for dinitronaphthaline, based on the weekly prices per pound and including each month of the year:

High and Low.

	1917	
	High.	Low.
January	...	.75
February	.80	.75
March	.80	.75
April	.80	.75
May	.80	.60
June	.70	.60
July	.70	.60
August	.70	.60
September	.70	.60
October	.70	.55
November	.62	.55
December	.62	.55
Year	.80	.55

Naphthaline (flake).

There was no great variation in the price of naphthaline flake throughout the year 1917. The demand for this material was heavy for the entire twelve months, and producers had their hands full meeting the requirements of domestic consumers almost wholly. This state of affairs was particularly true of the last two months of the year when supplies were exceedingly difficult to obtain in a large way, the only offerings being of small lots, and then generally resale material. Imports of the commodity from England fell off greatly until near the close of the period under review they were practically nil. This condition allowed American manufacturers to virtually dictate prices. Production of naphthaline in the United States during 1917 was estimated at 25,000 tons, approximately. This total compares with an aggregate output in 1916 of 12,500 tons. Subjoined is a table showing the high and low prices prevailing each month for the last two years, being computed from the closing weekly quotations per pound for the flake quality of naphthaline:

High and Low.

	1916		1917	
	High.	Low.	High.	Low.
January	13	13	10½	9
February	14	13	10	9
March	15	14	10½	9
April	15	14	10½	9⅛
May	14	14	10½	9½
June	12½	11½	10	9⅛
July	10½	8	10	9
August	8	8	9½	9
September	8	8	9½	9
October	8	8	9⅝	9
November	8	8	10	9⅛
December	9½	9½	10	9⅝
Year	15	8	10½	9

Nitrotoluol.

For practically the entire year the market for nitrotoluol ruled steady and almost without change in prices. This condition was due to the nominal position of toluol and the fact that there was no pressure of offers in the market while at the same time the demand for the material was of moderate proportions. Highest prices for the commodity prevailed in the first two months of the year and after a decline to lower levels the price range remained unchanged until the close of the year. In the following will be found the high and low prices for each month of the year based upon the price per pound on the spot at the close of each week's market:—

High and Low.

	1917	
	High.	Low.
January	..	..
February	80	55
March	65	50
April	60	50
May	60	50
June	60	50
July	60	50
August	60	55
September	60	55
October	60	55
November	60	55
December	60	55
Year	80	50

Paranitraniline.

The market for paranitraniline may be taken as a good example of the growth of the American manufacture of coal-tar intermediates. The output of this derivative was largely increased during the year, so much so as to cause a steady decline in prices for the first seven months of the year in the face of a rather good and consistent demand for the commodity. In the opening months of the year the prices ruled at the high point of the review period and were sustained at that point by the fact that many producers of the coal-tar derivative were greatly behind in the fulfillment of outstanding contracts. Output kept increasing and the previous demand continued, dye producers constantly increasing their inquiries. Prices declined slowly and the lowest figure of the year was touched in December, though for the three months previous the market had been practically stationary in price. In the subjoined compilation is contained the high and low prices of each month based on weekly prices per pound:—

High and Low.

	1917	
	High.	Low.
January	$1.75	$1.45
February	1.60	1.35
March	1.40	1.25
April	1.30	1.15
May	1.25	1.15
June	1.25	1.15
July	1.25	1.15
August	1.20	1.10
September	1.20	1.10
October	1.20	1.10
November	1.15	1.10
December	1.20	1.06
Year	1.75	1.05

Phenol (U. S. P.).

Price fluctuations in the market for phenol, U, S. P., were numerous and to a certain extent continuous throughout the year, giving the market considerable interest to the trade in general and placing this commodity in the position of market leader. Changes in quotations were daily occurrences and sometimes they took place hourly because of the steady demand from both domestic and export sources. At the beginning of the year prices were at their highest, showing a wide range in figures, based upon the differing opinions of the various producers. Production was largely increased and prices receded until a decline of 25 per cent. had been made under the top level. This was in August. From that month onward prices showed an inclination to move upward again as surplus quantities which had been depressing the market were absorbed. By November quotations had again touched the level prevailing in the opening months of the year and the tone of the market was firm. Government commandeering of the product for the making of explosives began around December 15, and there was at the same time a large call from dye makers. This practically cleared out the spot market and a nominal condition ruled until the close of the year, with reports heard of occasional sales of small lots at figures considerably over those quoted by manufacturers. Indications of easier conditions were seen as the final week of the year closed, the government having arranged for its supplies in a satisfactory manner. High and low prices each month of the year are in the appended table, the figures representing price per pound as computed from the weekly closing figures:—

High and Low.

	1917	
	High.	Low.
January	..	..
February	55	47
March	49	43
April	45	40
May	45	40
June	45	41
July	43	40
August	42	40
September	43	40
October	50	42
November	55	48
December	55	53
Year	55	40

Toluol (Pure).

There was no great variation in prices from month to month in the market for toluol throughout the first ten months of 1917. The range for the most part of the period was from $1.75 to $2 per gallon for prompt business, but this was changed in November when the government entered the market and requisitioned practically the entire supply of this coal-tar crude. The shortage which immediately occurred among producers of dye intermediates became pronounced and occasional small lots that found their way into second hands were disposed of at exceedingly high prices, sometimes as much as 300 per cent. higher than the nominal market price. After a few weeks of these conditions, with practically all of the output going to the makers of explosives, producers of intermediates succeeded in making a sort of arrangement with the government whereby they were enabled to obtain moderate amounts for their needs from time to time, but the supplies so released were just about sufficient to keep the industry going in a sort of hand-to-mouth fashion, and as the end of the year arrived it was felt that a committee would be appointed to handle the situation in a more business-like way. While accurate figures are not available at this writing, it is estimated that the year's production was much greater than in 1916, when an aggregate of 8,000,000 gallons of toluol were manufactured by producers. In the following table will be found the high and low prices for each month based upon the weekly price per gallon in the local spot market:—

High and Low.

	1917	
	High.	Low.
January	2.15	1.75
February	2.00	1.75
March	2.00	1.75
April	2.00	1.75
May	2.00	1.75
June	2.00	1.75
July	2.00	1.75
August	2.00	1.75
September	2.00	1.75
October	2.00	1.75
*November	2.00	1.90
*December	3.00	2.00
Year	3.00	1.75

*Nominal.

Acid, Benzoic (ex-toluol).

Increased production by American manufacturers of benzoic acid served to steadily reduce the price of the acid derived from toluol from January, when the highest figure of the year prevailed, to October when prices reached their lowest point. There was a good demand for the acid by producers of dye intermediates, which served to absorb much of the increased production. The demand fell off somewhat as the fall approached, but with the first week in November it increased again to a noticeable extent and second hands with a speculative view entered the market to a large extent. While they had not succeeded in forcing prices much higher by the time the end of the year arrived, they were in a better position to do so as the demand has become heavy and it was well believed that the production at the time was not sufficient for the current requirements. This gave the market a firm tone and, with the turn of the year, it was apparent that considerably higher prices would rule for the early months of the new year. In the following table is contained the average high and low prices, based upon the weekly closing price per pound:—

	1917	
	High.	Low.
January	9.00	8.25
February	8.75	8.25
March	8.50	8.00
April	8.50	6.50
May	7.00	6.00
June	6.50	5.00
July	5.00	3.75
August	3.75	3.00
September	3.00	1.80
October	2.05	1.75
November	....	2.25
December	3.25	2.75
Year	9.00	1.75

Acid, Cresylic.

As the year advanced supplies of cresylic acid became increasingly hard to obtain and prices ascended accordingly, reaching their high point in the month of October. The levels reached in that month were maintained thereafter without quotable alteration to the close of the year. Throughout the period under review there was a steady demand of fairly large proportion for this coal-tar product, but with the entrance of the United States into the war and the subsequent scarcity of shipping space imports of the commodity from Europe gradually decreased until around the middle of December they had fallen off to practically nothing. So far as could be learned to this writing there were no American producers offering cresylic acid in the market. The close of the year gave every indication that the high prices then prevailing would continue for some time, with a possibility that higher figures might be asked within a short period after the turn of the year. Subjoined is a compilation of the high and low figures per pound for the spot, computed from the closing the 95@97 per cent. cresylic acid on weekly prices:—

	1917	
	High.	Low.
January	.80	.75
February	.80	.75
March	1.00	.75
April	1.00	.90
May	1.15	.90
June	1.10	1.05
July	1.10	1.05
August	1.10	1.05
September	1.10	1.00
October	1.15	1.00
November	1.15	1.05
December	1.15	1.10
Year	1.15	.75

Acid, Picric.

For the greater part of the year the market for picric acid was a nominal affair, with practically the entire production going to the government. Very little of the acid was to be found in the spot market, and when small lots did make their way into the open trading they were quickly absorbed at high prices. Only a few producers were making this commodity at the close of the year, and what supplies were going to manufacturers, making other than war essentials, were doled out from time to time by special arrangement with the government. Owing to the great demand for picric acid for the making of explosives, manufacturers in various countries during the year turned out large quantities of phenol in a synthetic way. In Italy one firm last spring was turning out picric acid from by-product gas and coke ovens a total of 28 tons of picric acid daily, while various concerns in England were producing at the rate of 50 to 60 tons per day, and in France one firm alone was producing 150 tons of synthetic phenol daily for the making of picric acid. Other plants in that country were making an average of 30 to 50 tons daily for the same purpose. One of the largest orders placed at a single time during the year was one for 12,000,000 pounds of picric which the government placed in November with a powder making company now in the hands of receivers. With this will be found the high and low price per pound for each month computed from the weekly closing figures:—

	1916		1917	
	High.	Low.	High.	Low.
January	$1.50	$1.00	$0.95	$0.75
February	1.00	1.00	.95	.70
March	1.00	1.00	.95	.75
April	1.00	1.00	.95	.70
May	1.50	1.00	.90	.80
June	1.50	1.50	.90	.75
July	1.50	1.50	1.00	.75
August	1.50	1.25	.90	.70
September	1.00	1.00	.80	.75
October	.90	.90	1.00	.75
November	.90	.90	1.00	.85
December	.80	.80	1.00	.80
Year	1.50	.80	1.00	.70

Acid, Salicylic.

The salicylates were produced on a rather large scale during the year and there was a particularly good demand for salicylic acid, the U. S. P. quality being in particularly good call as compared with the technical material, which was not so active. Prices were high at the opening of the year, but declined sharply in March, when production showed heavy increase. With the arrival of June, however, an upward movement carried prices toward the high point of the year, which was reached in August. From that month there was little change in prices or conditions, and the market was comparatively firm, with a good call readily absorbing supplies as they became available. This condition existed with the close of the year, and the firmness then noted appeared to be due to stay for some months to come in the new year. The high and low prices per pound are contained in the annexed table, showing the average for each month of the year upon the closing weekly prices for the U. S. P. quality:—

	1916		1917	
	High.	Low.	High.	Low.
January	$4.00	$3.90	$1.10	$1.00
February	3.90	3.90	1.05	.80
March	4.00	4.00	.85	.75
April	4.25	4.25	.85	.70
May	3.75	3.50	.85	.80
June	3.40	3.40	1.35	.85
July	2.25	2.25	1.35	.85
August	2.25	2.10	1.45	.85
September	1.75	1.50	1.40	.85
October	1.50	1.50	1.40	.85
November	1.35	1.20	1.40	.80
December	1.00	1.00	1.35	.90
Year	4.25	1.00	1.45	.75

POTASSIUM CHLORATE.

Italian Supplies in Hands of Government for Explosives Manufacture.

Powdered potassium chlorate in Italy is under the control of the government, as it is used in making explosives. The Italian production of chlorate of potash is larger than the consumption. In fact, this article in normal times is exported to the United States and other countries. At present both production and consumption are much larger than in ordinary times. Considerable quantities are supplied to France. The latest government statistics show that 8,896,000 lire worth of chlorate and perchlorates of potash and soda were supplied to France during the first quarter of 1917.

Several firms in Italy employ this chemical in the manufacture of articles not used for the war, and these firms are said to encounter serious difficulties in obtaining their supplies. They have found it necessary to turn to the American markets for their requirements. In fact, during the first quarter of 1917 there were 790,000 lire worth of chlorate and perchlorate of potash and soda imported into Italy, including the shipments from the United States. The users of chemical products do not order direct, but invariably buy through representative agents.

The largest factory in Italy producing chlorate of potash is Officine Elettro Chimiche Dr. Rossi, of Legnano, Province of Milan.

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Sulphate of Copper
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Chloride of Lime
Citric Acid
Salicylates
Aniline Oil

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1917 WAS BANNER YEAR IN VEGETABLE DYESTUFF INDUSTRY IN UNITED STATES

Impetus Given When Synthetic Foreign Colors Were Cut Off Not Lost Last Year—Bulk of Dye Bases Well Under Control.

While the use of natural or vegetable dyestuffs in the United States has been increasing for many years, and there was a considerable industry here in that line prior to the outbreak of the European war, the commencement of hostilities which shut down on supplies of synthetic dyestuffs from abroad gave a great impetus to the use of the natural materials, and the industry recorded large increases in output, consumption and capital invested in the next two years. There was, however, a greater expansion in the year 1917 than in the preceding years, according to the best estimates available.

Of course, the consumption of the natural or vegetable materials was largely reduced by the growth of the synthetic productions in 1917, but enough of the gains previously made were retained to make the year under review probably the best that is known in the general market for dye bases and dyewoods.

Natural Dyestuffs.

In this general market the list of natural or vegetable dyestuffs forms the majority of items. The chemical agents included in the list, as would be naturally expected from the position of the market for other chemical descriptions, were relatively in a strong position throughout the year. This is particularly so of the bichromates and the prussiates, while phosphate of soda and zinc dust show a comparatively steady volume of trade at good prices for the greater part of the year, though there were times when these two items were in a weak position because of a smaller demand in the face of larger domestic productions.

The bichromates were well under the control of the leading producer throughout the year, as the output of the other smaller manufacturers of the potash and soda qualtites was not large enough to have a material effect upon prices or conditions. This was particularly so of the soda material for the production of which there were about eight plants in the country at the beginning of the year, but which number had dwindled down to three before the third quarter of the year had arrived. There were but three plants producing the potash material.

Logwood.

Logwood was, of course, the leader in the list of natural or vegetable dyestuffs, and while there were no such sensational conditions in that market during the year as had prevailed in 1916, the business done was of a steady character at well sustained prices. At times spot stocks were low and the inability of importers of the wood to obtain sufficient ocean transportation for cargoes served at various times to keep the market in restricted supply. The decrease in imports of the wood is well shown in a recent report of a government bureau covering the movement of the wood into the country for the last three calendar years.

According to this report there was a total of 61,35 tons of logwood, having a value of $1,519,878, brought into the country in 1917 as compared with an aggregate importation of 186,816 tons in 1916, valued at $6,097,576, and 60,958 tons, worth $832,196, in 1915.

Another government report gives some interesting figures on the consumption of the wood in 1913 and 1916 by textile mills of the country. According to it eight important silk mills used 169,628 pounds of the wood in 1916, for which they paid $48,236, while their 1913 consumption was 31,000 pounds, worth $2,550 in 1913. The average price per pound in 1916 was 28c. while it was only 8c. in 1913. The figures represent an average increase of 447.2 per cent. in quantity used and 1,791.6 per cent. in average price per pound.

Twenty-three cotton mills used 785,611 pounds of the wood in 1916, valued at $179,085, and 214,270 pounds, worth $9.490, in 1913. This is an increase of 1,787.1 in average price per pound and 267 per cent. in average consumption. Woolen mills required 4,472,424 pounds, worth $1,355,145, in 1916, as compared with 712,656 pounds, valued at $50,589, in 1913. The average increase in price per pound to these interests was 2,174.2 and the average increase in consumption was 527.5 per cent.

Natural Indigo.

The war-time demand for dyestuffs was greatly felt in the market for natural indigo and prices were higher in 1917 than in many years, excepting, of course, the speculative prices prevailing for a time in 1916. Great impetus to the growing of the material was given in both India and in Central American states. In Honduras, which is one of the Central American producing countries, the area sown in 1917 totaled 3,855 manzanas, against 1,367 manzanas under cultivation in 1916. A manzana is equal to 1.72 acres of land. With the primitive methods of cultivation and extraction in use in that country about 30 pounds of indigo is obtained per manzana, so that the output of this small district in 1917 is estimated at approximately 100,000 pounds.

Exports of indigo from London to United States in the eleven months of 1917 ended November 31 were valued at $1,200,918, against an aggregate of $1,680,731 in 1916. Imports of synthetic indigo in the United States during the calendar year of 1917 totaled 1,411,998 pounds, with an aggregate value of $896,468, while the 1916 total was 141,990 pounds, worth $121,250.

Indigo Acreage Increased.

According to recent advices the acreage under indigo in India during 1916-1917 was increased by 114 per cent. to 756,400 acres, with an estimated dye yield of 95,500,000 pounds. The increase in Madras was about 45 per cent. in Bihar, and Orissa 53, and in the United Provinces 252 per cent. Exports during 1916-17 of indigo from India were free from any restrictions. In connection with the exports of indigo it was noted that supplies of aniline colors were defective and in 1316 the British Government appointed an expert to investigate natural indigo, but according to latest reports little seems to have been done in India toward the standardization of the quality of the indigo paste placed upon the market, though there was a good demand for the product.

During the years ended March 31, 1916, and March 31, 1917, the exports of indigo from India to the United States aggregated 4,921,000 pounds and 5,033,000 pounds, respectively, having aggregate values of $1,064,141 and $1,116,700, respectively.

Quebracho Extract.

Another natural dyestuff which received a greatly increased call as a result of the war and which has shown large increases in consumption therefore is quebracho extract. Call for this material from tanners grew by leaps and bounds, so to speak, after the war started and after it was found that the dyestuff gave more satisfactory results than many other materials which had been in use. According to experts there is no tanning material extant which will tan through leather quicker and more evenly than quebracho, and for that reason it is now employed in the early stages of tanning in practically every tannery in the country. The improved color and solubility of the extract has also added to its efficiency and generally favored use among tanners.

These facts have resulted in the market for this material being a very firm affair for practically the entire year, and while prices have not been changed greatly at any time in the twelve months they have been strongly held by sellers at all times. Government figures place the imports of the extract in the calendar year 1917 at 108,903,077 pounds, valued at $7,192,666, as compared with imports of 67,088,378 pounds, worth $5,323,096, in 1916, and 82,182,141 pounds, valued at $3,145,819, in 1915.

Sumac.

The market for sumac has been another consistently strong affair throughout the twelve months of 1917, and high prices have prevailed for the year because of the scarcity of spot stocks at most all times. This scarcity, it is stated, was due principally to the fact that Sicilian speculators bought up practically the entire crop of sumac late in 1916 and held it rather tightly throughout 1917 for increases in price, releasing only relatively small quantities from time to time and as prices seemed to suit their fancy. There was a total of 12,906,647 pounds, having a value of $419,692, imported into the United States in 1917 and 17,454,996 pounds, worth $472,590, in 1916. The 1915 imports totaled 14,553,174 pounds and had a value of $349,549.

Other Vegetable Dyes.

Gambier was an item that had an active market for most of the year, and toward the close the spot market had become almost bare of supplies while at the same time there was a good call for it. Demoralization of freight conditions in the Far East was given by many in the trade as the deplorable reason for the dearth of material here, it being stated that reports were constantly received of immense quantities of freight being piled up at Singapore waiting removal, but unable to be moved for lack of shipping facilities. Many shippers found it cheaper in the long run to move their goods by small boats to Java ports, where Dutch steamers were found more available for their purposes.

Supplies of turmeric were getting low at the end of the year after an active market during the twelve months of 1917, and it was becoming a problem with sellers where they would obtain new stocks, as arrivals were slo and infrequent, it being thought that new supplies would become even smaller in quantity and less frequent in arriving during the coming year of 1918. Prices were therefore very firmly held by sellers at the latter end of the year, though they might be said to have been relatively firm throughout the entire review period.

Most of the other items of the general list were in good technical position throughout the year, though probably not in as great a demand as those which have been mentioned. In the following reports will be found more comprehensive statements as to the markets for those principal items of the list:—

Acetate of Soda.

After dropping slightly below the levels which had prevailed for the first two months of the year, prices for acetate of soda became firmer under a renewal of consuming interest and ruled without change for four months or until the last week in June. Thereafter the views of sellers were toward higher figures, and the market began to move upward under a continued good demand of what could be called heavy proportions. The apex of this demand was reached in October, when prices had increased 50 per cent. in some directions, and the market had become absolutely bare of stocks. Buyers were practically clamoring for supplies in the final month of the year, but were unable to obtain other than occasional lots which found their way to the local spot market and were disposed of quickly at good figures. Railroad embargoes against movement of the material from the works to the consuming point were a large factor in this market and were principally responsible for the baring of the spot market. This condition ruled at the end of the year, and there were no signs that spot stocks would be other than of the scantiest kind for some months to come, prices being therefore entirely nominal. In the following table will be found the high and low spot prices prevailing each month of the year, being based upon the weekly figures per pound:—

	1917	
	High.	Low.
January	14	9
February	12	9½
March	10	9
April	10	9
May	10	9
June	10	9
July	10	9½
August	12	9½
September	12	10½
October	13¼	11½
November	15	11½
December	16½	14
Year	16½	9

Albumen.

For more than half the year 1917 the market for albumen of all varieties was of a nominal character, with supplies of both the blood and egg qualities hard to obtain in other than small lots. In fact, there was a period of several weeks in October and November when virtually no spot stocks of imported blood albumen were to be found and the small lots heard of were disposed of entirely through private dealings. For the first two months of the year the price of prime Chinese egg albumen ruled unchanged, with stocks steadily decreasing. Prices then began to move upward, the inside price gaining nearly 33 per cent. within the following three months. Stocks were largely depleted, and there was difficulty thereafter for the balance of the year in replenishing spot supplies because of the strict enforcement by the government of regulations designed to prevent the entrance of Chinese egg albumen which contained too great quantities of zinc. Considerable quantities of the commodity arriving from the Orient in November and the early part of December were refused admittance to the country on the West Coast and were destroyed by government order on being found in an impaired condition for that reason. The end of the year did not give any indication that prices would be materially lowered for some months to come, but, on the other hand, there were indications that higher figures might prevail because of the increasing difficulty being experienced in obtaining stocks of both the blood and egg qualities from abroad. Domestic blood albumen was nominal and in scanty supply for the greater part of the year also. Only a few handlers of this commodity were in the market at any time, and there were no pressure of offers to sell at any time. The tone of this market was exceptionally firm for the entire twelve months under review. Subjoined will be found a compilation of the high and low prices for each month of 1917, taken from the price per pound prevailing at the close of the market for egg albumen each week:—

	1917	
	High.	Low.
January	80	76
February	80	76
March	90	80
April	86	82
May	90	84
June	1.05	88
July	1.05	1.00
August	1.05	1.00
September	1.05	98
October	1.10	1.00
November	1.10	1.00
December	1.10	1.00
Year	1.10	76

The Bichromates.

Throughout the year the markets for the bichromates of potash and soda were comparatively firm. While there were occasional periods of ease in prices under slackening in demand, the tone of the market continued about unchanged. This was mainly due to the fact that the leading producer continued to largely control the production of these items, there having been no large degree of competition from other sources of production. Of the two items, the principal interest of traders was in the soda quality which was the most active, and in fairly steady demand, if the year be taken as a whole. In fact, the demand increased largely toward the end of the year, with the number of producers reduced from eight to three, the possibility of the government commandeering the supplies of chrome metal being at all times a factor in the situation. With the close of the year in sight, prices were somewhat lower than they had been for several months previous, but there were indications that much higher figures would obtain in the new year, as stocks were getting low and the transportation situation was hampering the movement of supplies to a great extent. The potash quality was steady throughout the year, and there was relatively little alteration in prices. Stocks were moderate throughout, and there was a fair demand in evidence most of the time. Of the three makers of this quality, one had stopped production sometime before the close of the year, a fact which tended to reduce considerably the stocks on the spot. The following compilation shows the high and low figures each month of last year for both the potash and soda bichromates, and is taken from the weekly price per pound prevailing in the local spot market:—

Bichromate of Potash.

	1917	
	High.	Low.
January	43	40
February	41	38
March	40	35½
April	38	35
May	38	35
June	37	36
July	37	36
August	39	36½
September	50	38
October	46	45
November	46	45
December	46	43
Year	50	35

Bichromate of Soda.

	1917	
	High.	Low.
January	20	18
February	20	17
March	20	16½
April	20	14
May	16	13½
June	17	15½
July	17	15½
August	16	15¾
September	28½	15¾
October	26½	23½
November	18½	18
December	18½	17½
Year	28½	13½

Gambier.

The year 1917 will go down in the annals of the market for gambier as the best on record up to that time, that is, so far as activity and prices may be concerned. While the levels ruling in the market for the first eight weeks of the year were the lowest of the entire twelve months, it was due more to the fact that it was the off season in trading, and not to any weakening in tone, consumers apparently being taken care of under existing contracts or having been stocked up previously. The stringency in spot supplies, which had been noticeable throughout the year 1916, continued, and became more acute as the new year advanced. Prices advanced sharply in March, and there were further increases in the subsequent months until the final month of the year, when the highest price of the twelve months prevailed. Throughout the last quarter of the year there were no large supplies of any of the grades of gambier to be obtained, a fact which was particularly true of the cube material. Common gambier, which received the greatest call, became an almost intangible article among dealers, and all who had any to offer were decidedly strong in their views as to prices. Arrivals throughout 1917 were small and spasmodic, a fact which kept the spot market in very scanty stocks. Demand was large from all quarters. Transportation difficulties added to the confusion of the situation, so to speak, the lack of sufficient ocean bottoms being especially felt. Freight conditions at

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Singapore in the last quarter of the year were reported as being beyond description almost. Shippers of gambier from that port were many times forced to transport their goods to Java in order to get shipping space on vessels bound for the United States. This was so because of the confusion existing at Singapore, where it was stated freight was literally piled "mountain high" and unable to be moved for lack of shipping space and British export embargoes. Subjoined to this is a table showing the high and low prices for common gambier each month, taken from the price per pound prevailing at the close of each week.:—

	1917	
	High.	Low.
January	12	11¼
February	13½	12
March	15½	13½
April	15½	15
May	16	15
June	16½	15½
July	17	16½
August	17	15½
September	16	15½
October	17¼	15¾
November	19	16
December	21½	20
Year	21½	11½

Indigo.

There was an active market for indigo, both the natural and synthetic kinds, for practically the entire year. Increased output by domestic manufacturers of synthetic indigo had a slight effect on the consumption of the natural material, but it was comparatively slight because of the larger output of colors by American manufacturers, and the slight falling off in the demand for the vegetable material was not felt to any great extent after the first few weeks of the year. Prices ruled generally steady throughout the year, and fluctuations were slight at all times, due generally to slackening demand. The heavy war-time demand for the vegetable variety of indigo had a stimulating effect on the cultivation of indigo wherever it was grown and nowhere was this more true than in the little state of Honduras, in Central America. While the cultivation of indigo in that country had never been wholly abandoned, it was neglected to a large extent so far as growing for export business was concerned, and the crops raised each year were generally confined to the uses of the natives prior to the start of the war. The centre of the indigo industry in that nation is around Camasca, close to the southern part of the republic and near the border of Salvador, where the product is marketed, so that it does not show on the export returns of Honduras. The acreage sown to indigo around Camasca in 1916 was 1,367 manzanas, while the total in 1917 aggregated 3,585 manzanas. A manzana is equivalent to 1.72 acres. With the most primitive of tools and methods which are used in Honduras the yield of indigo is on an average of 30 pounds per manzana, so that the aggregate estimated yield in 1917 was about 100,000 pounds.

In the year, March 31, 1916, to March 31, 1917, the cultivation of indigo in India, despite an unfavorable season, showed great increases in the various districts. The area under cultivation was increased by 114 per cent. to 756,400 acres, while the yield was estimated at 95,500,000 pounds of indigo. The increase in Madras was about 45 per cent. and in Bihar and Orissa 53 per cent., while the increase in the United Provinces was 252 per cent. Exports of indigo in that period were freely made without restrictions. There were numerous complaints that the supplies of aniline colors from India were defective, and in October, 1916, the British Government appointed an expert to investigate the conditions existing in the industry. Little seems to have been done, it is stated, toward the standardization in India of the quality of indigo paste placed upon the market. Exports of indigo from India to the United States in the period mentioned aggregated 5,033,000 pounds, valued at $1,116,700, while for the previous year exports totaled 4,921,000 pounds, worth $1,064,141. The total exports to all countries were 13,614,000 pounds, worth $3,242,329, in 1916-1917, and 13,147,000 pounds, valued at $2,852,742 in 1915-1916. Exports of indigo from London to the United States in the eleven months ended November 31, 1917, aggregated $1,200,918 compared with $1,680,731 in the corresponding period in 1916. According to official government figures the imports of synthetic indigo into the United States in the calendar year 1917 amounted to 1,411,998 pounds, valued at $896,468, which compares with an aggregate of 141,990 pounds brought into the country in 1916 and having a total value of $121,250. The end of the year found the local market rather quiet, with stocks on hand moderate but not sufficient to care for any greatly increased demand, and prices were being steadily maintained by sellers who were looking forward to increased demand with the approach of the spring season of the coming year.

Logwood.

With the exception of a period of about eight weeks, or during July and August, the demand for logwood, both the crude wood and the extracted products, was of large proportions and of a steady character from dye makers. Prices were therefore but little changed throughout the entire year and the tone of the market was relatively firm for the twelve months. Lack of sufficient ocean tonnage served to keep the spot market from showing any surplus supplies and while this condition was true of the first half of the year it was particularly true of the last six months, when dealers in the wood experienced the added difficulty of finding berths for incoming vessels and their cargoes. High demurrage charges were ruling at the close of the year. Imports of the wood for the year were more than 50 per cent. less than they had been in 1916. Official government figures for the calendar year and for the years 1915 and 1916 follow:

	Tons.	Value.
1917	61,725	$1,519,878
1916	186,816	6,097,576
1915	60,958	832,196

The greatest part of the wood brought into the country came from Haiti and, while the figures are lower for last year than they were for the previous period of 1916, it is stated by the government that the large stores of wood which were piled up at shipping points in Haiti have been practically depleted. A few small lots are still there, but they are reported as being held by enemy aliens. Imposition of strict regulations against the bringing from the interior of the island to the ports for shipment of poor wood has had a salutary effect on the trade, the American army of occupation working in conjunction with the local gendarmerie to see to it that only the highest class of wood is presented to buyers.

Prices for logwood products have been steady throughout the year and in the last few months of the period under review increases were recorded, due to the higher cost of production generally. In the early part of the year there were considerable quantities of extract of a poor tinctorial quality, though of the required twaddle, put upon the market. For a time they found a ready sale, but soon lost ground with the demand from dyers for higher tinctorial strength. There was, however, a wide range of prices throughout the year for the extract, which was due mainly to the presence in the market of a great variety of brands and quality. Exports of logwood extract in the calendar year 1917 had an aggregate value of $1,404,709. Considerable quantities of these exports were for consumption in India and the far East, while France, Great Britain, Italy and Switzerland were also large buyers because of their inability to get the crude wood, through scarcity of shipping space.

An interesting fact about logwood prices is contained in a census of the dyestuff industry recently compiled by the United States Tariff Commission in which it is stated that logwood shows the greatest average increase in price of any natural dyestuff used by the textile mills and other dyers. The 1916 price to cotton mills was on an average of 23c. per pound against 5c. in 1913, representing an average of increase of 1,787.1, while silk mills paid 23c. in 1916 and 8c. in 1913, an average increase of 1781.6 per pound. Woolen mills paid 8c. per pound in 1913 and 30c. per pound in 1916, an average increase of 2,174.2 in price.

The following table contains the high and low prices for logwood per ton for each month of 1917, based upon the weekly quotations:

	1917	
	High.	Low.
January	42.00	25.00
February	42.00	30.00
March	42.00	30.00
April	40.00	30.00
May	40.00	30.00
June	42.00	28.00
July	35.00	30.00
August	35.00	30.00
September	43.00	30.00
October	43.00	37.00
November	43.00	37.00
December	43.00	36.00

The Prussiates.

Increasing strength was noted throughout the year 1917 in the markets for prussiate of potash and prussiate of soda. While stock on the spot had been largely increased by larger American production of both qualities this condition was not of long duration. Prices were at their lowest mark at the opening of the year but gradually forced their way upward as a constantly growing demand served to steadily absorb the large production. By the time the fourth quarter of the year had arrived there were but very limited stocks of both qualities to be had in the open market. The yellow prussiate of potash quality scored the greatest gain of two during the year, advancing from a low figure of 89c. per pound in the first week of February to a high point of $1.35 per pound, which was reached in the month of November. The yellow soda quality touched its lowest point in the first week in March while it sold at the highest price of the twelve months in the third week of July and continued at that point from then on to the latter part of October. The slight reduction in the outside figure which then occurred was due to a narrowing of the range because of the increasing scarcity of offers, rather than to any slackening of the demand or increased visible supply. There was little change in the market for the red prussiate of potash, either as to prices or conditions. Supplies of this commodity were hard to obtain at any time during the period under review and prices were held firmly for the twelve months at or very close to the range which had prevailed at the opening of the year. In the following table is contained the high and low prices per pound for the yellow qualities of both prussiates, based upon the prevailing weekly figure:—

Potash (Yellow).

	1917	
	High.	Low.
January	.95	.91
February	.93	.89
March	.93	.90
April	.95	.92
May	.96	.95
June	1.05	.96
July	1.10	1.00
August	1.10	1.08
September	1.27	1.08
October	1.30	1.25
November	1.35	1.25
December	1.30	1.25
Year	1.35	.89

Soda.

	1917	
	High.	Low.
January	36	34
February	35	32
March	34	30
April	34	30
May	34	30
June	34	30
July	38	32
August	38	
September	38	34
October	38	35
November	36	35
December	36	35
Year	38	30

Sumac (Sicily).

The demand for sumac was constant and of good size for the twelve months of 1917 and spot stocks were at no time adequate for the demand. Sales were reported from time to time at unusual prices, but the average inside figure for the first two months of the year was $80 per ton for the Sicilian variety. Thereafter the lowest quotation obtainable was $90 per ton up to the first week in July, when there was a slight reaction and a figure of $88 was heard for a brief period when demand showed signs of easing somewhat. But as arrivals were slow and of no great volume spot stocks were still low and prices jumped upward again and held steadily at the new level of $95 per ton from then onward to the middle of November, when as high as $105 per ton was obtained in some quarters though an inside figure of $100 was done in other directions. The close of the year found the spot market almost bare of stocks of the imported kind, while there were but scanty supplies of domestic material on hand and offered at relatively high figures. With regard to the Sicilian variety, it was stated that speculators in Sicily jumped into the market late in 1916 and purchased practically the entire crop, which they sold off slowly as prices arose, holding the bulk of the crop for still further advances. High and low prices are contained in the following table for each month, based upon the weekly price per ton at the week's end:

	1917	
	High.	Low.
January	.....	80.00
February	80.00	90.00
March	....	90.00
April	....	90.00
May	90.00	95.00
June	....	95.00
July	88.00	85.00
August	88.00	86.00
September	95.00	86.00
October	90.00	87.00
November	....	90.00
December	100.00	95.00
Year	100.00	80.00

FERTILIZER MARKET IN 1917 MADE NEW PRICE RECORD OWING TO WAR

Demand for Basic Materials for Munitions Use, Shortage of Vessels for Nitrate Shipments and Menhaden Fleet Commendeering All Vital Factors—Wide Search for Domestic Potash.

The principal feature of the fertilizer market during the twelve months of 1917 was the radical readjustment following the cutting off of supplies of fertilizer bases from foreign sources, and the consequent increase in prices of the completed fertilizer. Pyrites from Spain and nitrate of soda from Chile, phosphate rock from Florida—all were in greater demand than ordinarily because of the call upon the farmers of the country to meet the crop demands, not alone from the consumers of the United States, but for our allies. The fish fertilizer industry was given a severe setback. More than one-half the available menhaden fishing craft were commandeered by the government before the middle of the season, and the total catch did not begin to approach the normal, with consequent high prices for oil, and with fish scrap stocks almost exhausted at the close of the year.

In addition to the import and export situation the freight transportation service in this country became so completely disorganized because of so-called "preferential" shipments and the government-established embargoes upon movement of materials, that many of the producing plants were forced to seriously curtail their output. This, taken, with the requirements of the government that licences should be obtained for the importation and exportation of materials, led to the circulation of questionnaires to the end that both production and distribution demands could be definitely summarized by the government, with a view of apportioning both materials and transportation facilities to the absolutely essential needs of both manufacturers and consumers. By the first of the year 1918 the embargo on all other materials but food and fuel led to still further curtailment of effort by the fertilizer makers, although after a brief interval the Food and Fuel conservators made an exception inthe favor of fertilizer manufacturers and conditions were somewhat relieved.

The year as a whole from the point of view of the distributor of fertilizer was quite satisfactory, for while the output was handicapped, the prices obtained were so much above the normal that the result financially could have been much worse.

At the beginning of the year the prospects were unusually favorable. Farmers were urged by the government to exert every effort to produce banner crops, and this, of necessity, called for a larger Spring distribution of fertilizer than usual. The manufacturers, with the aid of the government, inaugurated an educational campaign, and the cry of "full carloads" and "early fertilizer shipments" to prevent later freight blockades was quite effective and to the advantage of the trade. Hence it happened that the first half of the year was not marked by intensity of conditions which made the last six months of 1917 so unusual and which brought such real hardship to the makers of fertilizing material.

With the exhaustion of the supplies of German potash, and with the demands from munitions manufacturers for basic materials, with the increased demand and the almost exorbitant prices of acids, and with the supply of Chilean nitrates cut down because of lack of bottoms in which to bring this material to this country, the close of the year was nothing if not dubious from the point of view of the fertilizer men. Prices for nitrate rose to a level of 5 cents a pound—an increase of approximately 2 cents a pound—and the government was forced to make arrangement for the direct purchase and shipment of nitrates, guaranteeing delivery to the farmers at actual cost, plus freight rates from the port of arrival. No control of actual conditions at the primary production point was possible, however, although diplomatic efforts were made by the United States and her allies direct with the Chilean Government. A central purchasing board was organized and did exert some influence in steadying market conditions.

Embargo restrictions against shipments of sulphate of ammonia on both sides of the Atlantic soon took away all interest. The government requested that all manufactured plants adjust their business so as to produce liberal quantities of anhydrous ammonia to meet the big demand for transport service and of the army and navy. Prices advanced to a level where fertilizer people were unable to use it profitably in their manufacturing business.

Imports of pyrites were greatly reduced with the general shortage of tonnage, and the government, in order to meet the big needs of sulphuric acid for war purposes, was forced to turn attention to domestic fields long allowed to remain idle. The Bureau of Mines took control and good headway has been made. With the government in need of such large quantities little appeared on the spot market and prices jumped accordingly.

Phosphate rock production in Florida and Tennessee was also greater than the previous season, but the congestion of the railroads was such that shipments were out of the question. With a forced curtailment of many of the big packing plants of the west blood and tankage were high throughout the year, especially toward the end of the season, when the best prices in the history of the trade were obtained.

Much interest was shown in the efforts of many producers to place the

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domestic potash industry on a better basis, and it can be truly said that despite all the drawbacks satisfactory progress has been accomplished. Now the producers have to make every effort to protect their investments, for the question naturally arises as to what is to become of the industry after peace is declared. Will they be able to meet the German competition, which through the enormous deposits can sell cheaper than any other country having a sufficient quantity to offer? It is admitted by leading authorities that domestic competition with German potash at the moment, if peace should be declared, is economically impossible on equal terms, and they are of the opinion that the only way to protect the home industry is by two methods, namely, by putting a tariff on the imports from Germany or else by subsidizing the domestic industrial enterprises to an appropriate degree.

Sulphate of Ammonia.

Production increased considerably in the early part of the seaon, but the entry of this country into the world war changed the entire situation. All sorts of embargo restrictions were placed on exports and shipments from interior points were difficult to make. Finally the government placed a complete embargo on all exports and the English Government followed suit by stopping shipments. At no time did any large amount of sulphate of ammonia reach the outside markets, producers having all they could do to meet the large contract orders on the books. As a result prices advanced and soon reached a point where fertilizer manufacturers were unable to use it. As war preparations advanced the government requested manufacturing plants to readjust their business so as to produce large amounts of anhydrous and aqua ammonia in order to meet the heavy demands coming from army and navy quarters and the manufacture of sulphate of ammonia ceased to be a factor. In January sales were made at $4.50 per 100 pounds, which was the low. In February and March business was done at $5.25 per 100 pounds and April and May at $5.50 per 100 pounds. In June a high of $6 was reached, but in July and August advances to $6.40 were established. During September and October prices moved up to $7.15, reacting to $7 in November, but again turning strong in December and closing the year at the high of $7.25.

Sulphate of Ammonia, High and Low.

The high and low for sulphate of ammonia for each month of the year follow:—

	High.	Low.
January	4.50	4.50
February	5.25	4.50
Marcn	5.25	5.25
April	5.50	5.25
May	5.50	5.50
June	6.00	5.50
July	6.40	6.00
August	6.40	6.40
September	7.15	6.40
October	7.15	7.00
November	7.00	6.75
December	7.25	7.00
Year	7.25	4.50

Nitrate of Soda.

In 1916 the production of nitrate of soda in Chile was estimated to be a record one, but the estimates for 1917, just received, show that further gains were made and that shipments were also larger than the previous season. Another important item was the large fluctuations in prices, gains being established that carried values to record levels. The production last year is figured at 2,959,320 tons, compared with 2,840,944 tons in 1917, and the shipments to the East coast and Canada were estimated at 1,252,950 tons, against 1,041,250 tons in 1916. In January nitrate of soda sold at 3.25c. advancing to 3.85c. in February, reacting slightly to 3.75c. in March and April, and then advancing steadily, reaching a high of 4.97½c. in September and October, closing at a range of 4.50 to 4.60c. in December.

Scarcity of ships was a factor the entire year, and it was only through special government action that the shipments were so large. Trade operations were hindered by the anxiety of producers to force prices higher, and while the allied governments tried to make arrangements for a special buying commission in the hope of bringing about a better trading basis, nothing became of it. Finally this government in an effort to protect the farmers made a purchase of 100,000 tons at a special price arranging for shipments covering the first half of this year.

The following table gives the shipments to the East Coast of the United States and Canada, as well as the production in Chile, by months:—

Deliveries to the East Coast of the United States and Canada.

	1917. Tons.	1916. Tons.
January	75,100	70,000
February	104,000	42,000
March	85,000	62,500
April	112,000	104,000
May	100,000	144,000
June	149,500	100,800
July	104,000	106,500
August	73,550	88,950
September	90,500	67,700
October	121,000	109,800
November	122,000	86,000
December	116,300	59,000
Totals	1,252,950	1,041,250

Production on the West Coast.

	1917. Tons.	1916. Tons.
January	245,000	256,440
February	223,000	204,000
March	249,980	248,060
April	246,400	242,018
May	252,000	243,000
June	243,182	234,006
July	248,409	241,489
August	250,909	245,317
September	229,008	214,743
October	251,363	238,277
November	255,000	231,000
December	265,000	242,000
Totals	2,959,320	2,840,944

High and Low by Months.

The high and low for nitrate of soda for each month of the year, per 100 pounds, prompt shipment, follow:—

	High.	Low.
Janunary	$3.25	$3.25
February	3.85	3.25
March	3.75	3.75
April	3.75	3.75
May	3.85	3.75
June	4.10	4.00
July	4.25	4.05
August	4.30	4.25
September	4.97½	4.65
October	4.97½	4.60
November	4.70	4.65
December	4.60	4.50
Year	4.97½	8.25

Phosphate Rock.

Prices of phosphate rock did not change much, although the trend of values were toward higher levels. Sales of South Carolina were made at $3.50 per ton in January, and this price held through to July, when producers were forced to ask $4 per ton, brought about by increased freight rates and the scarcity of cars. There was no change for the balance of the year. For the Tennessee grades $5 per ton was the ruling price until July, when an advance to $5.50 per ton was also named, due to the same reasons. No further price changes were made. As a matter of fact prices became nominal in December, for shippers were unable to fill contracts, the congestion of freight on the various roads forcing an embargo to be declared against shipments to many Northern points.

Marketed Production.

The quantity of phosphate rock marketed in the United States in 1916 was 1,982,385 long tons, valued at $5,896,993, an increase of 146,718 tons in quantity and of $483,544 in value over the production of 1915. This increase was comparatively small, but it indicates an improvement in the industry, and suggests that in spite of the curtailment in the exports the production of former years may in time be approached. The output in 1916 was less than two-thirds that in 1913, the year before the European war began.

The total quantity of phosphate rock sold in the United States from the beginning of the industry in 1867 to 1916, inclusive, is 52,275,958 long tons, valued at $206,723,164.

Amount Mined.

The quantity of phosphate rock mined in any year is not the same as that sold, for the quantity in stock at the mines at the end of the year is variable. The quantity mined in 1916 was 2,169,149 tons. Compared with the quantity mined in 1915, which was 1,935,341 tons, this was an increase of 12 per cent., as against a decrease of about 27 per cent. in 1915 from 1914. In Florida the increase was about 17 per cent., 24 companies operating in 1916, instead of 17, as in 1915. In South Carolina there was a decrease of 46 per cent. and in Tennessee an increase of 5 per cent. In Kentucky 1 producer reported rock mined. The production in the Western States decreased 55 per cent.

Stock on hand at the close of 1916 showed an increase for the entire country of 20 per cent., the total stocks being well over 1,000,000 tons. In Florida the increase was nearly 23 per cent. and in Tennessee it was nearly 15 per cent. In South Carolina, however, the stock on hand decreased 61 per cent.

High and Low by Months.

The high and low for phosphate rock, South Carolina and Tennessee, in ton lots, spot, for each month of the year follow:—

	High.	Low.
January—		
South Carolina	$3.50	$3.50
Tennessee	5.00	5.00
February—		
South Carolina	3.50	3.50
Tennessee	5.00	5.00
March—		
South Carolina	3.50	3.50
Tennessee	5.00	5.00
April—		
South Carolina	3.50	3.50
Tennessee	5.00	5.00
May—		
South Carolina	3.50	3.50
Tennessee	5.00	5.00
June—		
South Carolina	3.50	3.50
Tennessee	5.00	5.00
July—		
South Carolina	4.00	3.50
Tennessee	5.50	5.00
August—		
South Carolina	4.00	4.00
Tennessee	5.50	5.50
September—		
South Carolina	4.00	4.00
Tennessee	5.50	5.50
October—		
South Carolina	4.00	4.00
Tennessee	5.50	5.50
November—		
South Carolina	4.00	4.00
Tennessee	5.50	5.50
December—		
South Carolina	Nom.	Nom.
Tennessee	5.50	5.50
Year—		
South Carolina	4.00	3.50
Tennessee	5.50	5.00

Fish Scrap.

The menhaden fishing season in Southern waters was a keen disappointment the entire season and as a result small stocks of fish scrap were reported along the Eastern seaboard. One direct result was the establishment of record prices and this in a way offset the small catch. The demand throughout the season was good, although toward the end there was a tendency on the part of fertilizer manufacturers to turn from the market owing to the high prices asked. Many influences accounted for the unusual situation, the principal one being the war. Many boats used in the fishing trade were taken over by the government soon after the outbreak of hostilities and were placed in coast patrol duty. At one time the situation became so serious that the government ordered that all fishing stop, but this order was later modified. Severe storms all along the coast made fishing operations difficult and the boats were not able to operate anywhere near normal. At the start of the ,shing season in Southern waters in June prices were at 4.50c. and 10 per unit, but advances were soon established and in November sales were made at 6.67½c. and 10 per unit. The season closed earlier than usual and in December there was not a pound of fish scrap available in the Northern markets, while at points in the South the principal fish factories were closed. What little was for sale was from second hands and the same was true of oil.

High and Low by Months.

The high and low for last month of the year for fish scrap per unit, spot, follow:—

	Cents— High.	Low.
January	4.50 & 10	4.50 & 10
February	4.50 & 10	4.50 & 10
March	4.50 & 10	4.50 & 10
April	4.50 & 10	4.50 & 10
May	4.50 & 10	4.50 & 10
June	4.50 & 10	4.50 & 10
July	6.50 & 10	4.50 & 10
August	6.50 & 10	6.50 & 10
September	6.60 & 10	6.50 & 10
October	6.65 & 10	6.50 & 10
November	6.67½& 10	6.65 & 10
December	Nominal	Nominal
Year	6.67½& 10	4.50 & 10

Potash Salts.

With the imports practically reduced to a minimum it was not startling that trade interest was at a standstill so far as market conditions were concerned. Muriate grades sold at $450 per ton in January, which was also the high of the year, but hardly more than a few tons changed hands. In February some moderate sales were made at $425 per ton and this price held until May, when some business was done at $400 per ton, breaking to $390 in June, $380 in July and $340 in October and November, with the final price $350 per ton in December. On the other hand sulphate of potash moved up, sales in January being made at $275 per ton and in December at $360 per ton, with practically no difference in price between the muriate and sulphate grades at the close of the year. At the beginning of the year, however, muriate sold for $450 per ton and sulphate for $275 per ton.

The manufacturers of potash salts and potash products in the United States reported a production in 1916 of 35,739 short tons, having a mean content of about 27 per cent. potash (K_2O) and a total content of 9,720 short tons of potash (K_2O). This is almost exactly ten times the production reported for 1915.

Practically all the predicted possibilities as to potash found some fulfillment in 1916. The almost entire stoppage of supplies from abroad and the small stocks on hand with which to meet the requirements have at times carried the price of potash to a high figure. Much potash has been used as fertilizer, even under these conditions, and a quantity of high-grade sulphate produced in this country has been exported to Cuba to meet a special agricultural demand there.

Searles Lake.

Much of the present domestic production of potash is maintained by the war prices and can not be continued after these prices fall. Some of the projects may be permanent, but unfortunately their output is yet small. The only exception, perhaps, is Searles Lake, which now bids fair to produce enough potash to take the edge off the market by supplying the most urgent requirements for home consumption, such as those of the chemical industries, but the operation of the Searles Lake deposits is hardly yet under way. So far as is now evident, there is probably no domestic source adequate to supply more than a small percentage of the domestic consumption, but the slight promise should not by any means exclude all hope of larger success.

Practically all the potash used in this country has normally come from Germany. In addition to the potash materials used as ingredients of fertilizers, such as kainit and manure salts, almost the entire supply of the commercial salts—chloride (muriate) and sulphate—was received directly from German ports until 1914, only a small quantity finding its way through Belgium and the Netherlands. In 1914 these imports were greatly reduced, and at the end of January, 1915, they were practically ended by the promulgation of an embargo on the export of potash from Germany. The large imports reported from Germany in 1915 doubtless consisted of potash shipped from that country in January, before the embargo went into effect, or of German potash gathered by vessels en route or from supplies in storage in other parts of the world. Odd lots of potash came in during the latter part of 1915 from many sources in Europe, North America, and South America, and even from Asia and Africa. The same condition existed during 1916, except that the imports from Germany were entirely shut off, and the odd lots seem to have been derived from sources even more remote. It appears that the stocks of German potash salts throughout the world, outside of Germany and the central allied countries, are nearly exhausted.

Nitrate of Potash.

The situation in regard to nitrate of potash is somewhat different, as normally a part of this salt is derived by manufacture from Chilean nitrate and German potash, largely in Germany, and another considerable part is shipped from India, where it is obtained from the "saltpeter plantations." In 1913 the supply, in round numbers, was 2 500 tons from Germany, as against 3,000 tons from India; but in 1914 only 60 tons came from Germany and 1,700 tons from India; and both sources of supply were practically cut off in 1915. During 1916 somewhat more than 2,500 tons of saltpeter came from India to the United States, both directly and by way of England, doubtless by some special arrangement for the manufacture of munitions.

High and Low by Months.

The high and low for each month of the year for potash, muriate, 80 to 85 per cent. basis, and sulphate, 90 to 85 per cent. basis, ton lots, spot, follow:—

	High.	Low.
January—		
Muriate	$450.00	$400.00
Sulphate	275.00	275.00
February—		
Muriate	425.00	410.00
Sulphate	275.00	275.00
March—		
Muriate	425.00	425.00
Sulphate	275.00	275.00
April—		
Muriate	425.00	380.00
Sulphate	275.00	275.00
May—		
Muriate	400.00	380.00
Sulphate	275.00	275.00
June—		
Muriate	390.00	350.00
Sulphate	275.00	275.00
July—		
Muriate	380.00	360.00
Sulphate	275.00	275.00
August—		
Muriate	380.00	380.00
Sulphate	275.00	275.00
September—		
Muriate	380.00	325.00
Sulphate	350.00	275.00
October—		
Muriate	340.00	325.00
Sulphate	300.00	300.00
November—		
Muriate	340.00	340.00
Sulphate	350.00	300.00
December—		
Muriate	350.00	350.00
Sulphate	360.00	345.00
Year—		
Muriate	450.00	325.00
Sulphate	360.00	345.00

Acid Phosphate.

While the demand at no time was active for this particular commodity the range of prices was at higher levels, and to ward the end of the year a record basis prevailed. Raw materials were hard to obtain and the fact that manufacturers were able to find a ready outlet for all other acids led them to keep the manufacture of this grade reduced. As the season advanced embargo restrictions made shipments difficult and with higher prices consumers were limiting purchases to requirements. In January sales of acid phosphates were made at $11.50 per ton, this price holding until April, when a jump to $13 per ton occured. Gradual advances took place until October, when business was put through at $18 per ton, the high of the season. There was a slight reaction in November and December the final price being $16 per ton.

High and Low by Months.

The high and low for acid phosphate per ton, spot, for each month of the year follow:—

	High.	Low.
January	$11.50	$11.50
February	11.50	11.50
March	11.50	11.50
April	13.00	11.50
May	15.00	12.50
June	14.50	14.50
July	15.00	15.00
August	15.00	15.00
September	16.00	15.00
October	18.00	16.00
November	16.00	16.00
December	16.00	16.00
Year	18.00	11.50

Pyrites.

The war served to stimulate a tremendous demand for this commodity

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and the government during the past year gave special attention to the production and the means of transportation. Of course, no figures were available as to the actual amounts mined, but it is safe to predict that it was the largest in the history of the trade. Imports were reduced owing to the submarine menace and the high freights, as well as in the decrease in the number of steamers usually available for this trade. The domestic production in 1916, according to the latest figures issued, was 423,556 long tons, valued at $1,965,702, an increase of about 30,000 tons in quantity and about $290,000 in value, compared with 1915. The increase was largely attributed to the greater demand for sulphur industries connected with the war manufacturing plants here making goods for the Allied governments, for this country was not yet in the struggle.

Imports.

The imports of pyritic ore showed a notable increase during 1916, latest figures available, and were the greatest in the history of the industry. The following table gives the statistics for 1916 as well as for several preceding years:—

Year.	Long ton.	Value.
1911	1,006,310	$3,788,803
1912	970,785	3,841,683
1913	850,592	3,611,137
1914	1,026,617	4,797,326
1915	964,634	4,817,977
1916	1,224,662	6,728,318

Price fluctuations were not particularly active, but toward the end of the year domestic values moved sharply higher and closed at a range of from 20 to 25 cents per unit in the spot market, which compared with a range of from 11 to 12 cents per unit at the opening of the year. Foreign prices were nominally held at from 16 to 16½ cents per unit, but the freight rates were the controlling factor and on this all market values were based. The seller paid up to 13 shillings and the buyer the difference and freights at the end of the year from Spain were quoted at from 30 to 35 shillings per ton.

High and Low, Pyrites.

The following table is a monthly record of the high and low for the year of domestic, concentrates, pyrites, prices being based f. o. b. mines and of Spanish crure pyrites, prices based per unit, averaging 48 to 52 per cent. of sulphur, ex ship:

	High.	Low.
January—		
Domestic	12	11
Foreign	16½	16
February—		
Domestic	12	11
Foreign	16	16½
March—		
Domestic	12	11
Foreign	16	16½
April—		
Domestic	12	11
Foreign	16	16½
May—		
Domestic	12	11
Foreign	16	16½
June—		
Domestic	12	11
Foreign	16	16½
July—		
Domestic	12	11
Foreign	16	16½
August—		
Domestic	12	11
Foreign	16	16½
September—		
Domestic	12	11
Foreign	16	16
October—		
Domestic	12	11
Foreign	16	16
November—		
Domestic	20	11
Foreign	16	16
December—		
Domestic	25	20
Foreign	16	16

BALTIMORE FERTILIZER INDUSTRY FOUGHT HARD TO OVERCOME 1917 WAR CONDITIONS

Reduction of Basic Materials Supplies, Freight Embargo and Commandeering of Menhaden Fleet All Adverse Factors.

Baltimore, Jan. 31, 1918.

The fertilizer trade of this city has reason to look upon the business done in 1917 with greater satisfaction than there seemed reason to anticipate in the early part of the year. Concluding the third year of the war, it had begun to be troubled more insistently than before with various problems to which the world conflict had given rise, and the difficulties confronting especially this branch of the industry, which depended so extensively upon imports of various materials, were being accentuated more and more. With the cutting off of certain imports had come a fairly steady rise of prices on those supplies that could be obtained and that were either produced at home or were procurable elsewhere than in Europe. Furthermore, events were making it appear increasingly certain that this country would also become involved in the gigantic struggle, after determined efforts, continued for some thirty months, to keep out. The transportation problem had not at the beginning of 1917 assumed that acuteness which it took on later; nevertheless, it did not require prophetic vision to foresee that the obstacles in this direction were bound to grow formidable in course of time.

Exhaustion of Potash Supplies.

Even in 1916 some quantities of potash reached the United States from the other side of the Atlantic; besides, the extensive stores in this country had sufficed to enable practically all of the manufacturers to put out potash mixtures. By 1917, however, these stocks had become fairly well exhausted or, at least, so depleted that a revision of formulas was made necessary by the growing scarcity of this material and by the soaring price. The manufacturers of fertilizer mixtures, therefore, found their activities greatly complicated, it being essential not only to meet the demands of the farmers in the way of fertilizers, but also to effect the readjustments called for by the existing situation, and, above all, to keep within limits that would appeal to the farmers as wholly reasonable and would make them feel that the fertilizer trade was behind them to the fullest extent of its ability.

Inability to Market.

How the buyers would take the advances in the quotations, and also the changes in formulas, was a question that received the closest attention in the trade, which had still to deal with the South, at least in the early part of the year, that was hard hit by inability to market one of its chief staples to the best advantage. That all these questions and perplexities were met and solved in the manner which has now become trade history is one of the greatest tributes to the resourcefulness and the acumen of the fertilizer trade that could be paid. The buyers were disposed at first to complain about price increases, and it became necessary to convince them that the manufacturer, so far from taking advantage of the existing situation to earn extra profits, was in fact sharing the burdens to be borne, and that whatever advances were decreed represented not an arbitrary marking up of the figures and a benefiting by opportunity, but were dictated by absolute and unavoidable necessity.

Propitiating the Farmers.

From a state of discontent and of grumbling the agriculturists were brought to understand and allow for the drawbacks occasioned by war conditions, and were won over to co-operate with the manufacturers. This was strikingly shown in the success that attended the work of the Soil Improvement Committee of the National Fertilizer Association which had for its purpose the anticipation of wants and the placing of orders ahead of the usual time, so that the pressure upon the factories might be relieved, and all actual wants in the way of fertilizer mixtures met. From a policy of delay in the placing of orders the buyers readily passed to one of anticipating needs. It may be that an expectation of scarcity of mixtures and, especially, of further advances in the quotations had something to do with this readiness, but the fact remains that the buyers, by sending in their orders earlier than before, made the task of the manufacturers of supplying the farmers with mixtures a much easier one than it would have proved otherwise.

So well was this lesson driven home that the manufacturers continued to get orders for spring and summer delivery when they felt they had gone as far as possible in entering commitments on the spring basis of prices and promptly served notice that they were perfectly willing to book the orders in question but that the revised quotations made necessary by the rise in the cost of crude materials which had been fairly steady throughout the season, would have to govern these orders.

Less Inactivity Than Usual.

The interval of inactivity between the spring shipping season and the fall business was of far shorter duration than usual. Long before the buyers ordinarily enter the market a fairly good inquiry set in, and this experience has been repeated in an even more signal manner with regard to the requirements of the new year. In fact, it can be said that there were practically no intervals, with the exception of the midsummer period, the movement of one running almost into that of the succeeding season. The buyers have been brought to realize more than ever that the railroads cannot handle a given quantity of goods in the same time they needed before, even if they give preferential treatment to fertilizers, as they are permitted to do under the ruling of the Food Administration. The buyers, furthermore, know that the factorfes are confronted with many obstacles, not the least of which is difficulty in geting crude stocks and the labor essential to handle a given volume of materials. They have come patriotically to the aid of the trade by making arrangements to take goods much ahead of the regular time, and in this way a considerable tonnage has been moved, which will count for several times the quantity later on when the pressure to make shipment increases.

High Prices Met.

In addition it is to be said that the buyers have submitted almost gracefully to the further increase in prices which has been made by the manufacturers not only on account of the higher figures he must pay for his supplies, but also in consequences of the greatly augmented cost of production, everything that enters into the operation of plants costing more. The farmer is peculiarly settled in his ways and does not readily take to innovations, or what appear to be such. He adheres to the brands which he has been getting and he prefers the same size bags or other packages. The problem, therefore, which confronted the manufacturers of having to reduce the number of brands and, above all, put up goods in 200 pound bags, instead of 100 pounds, because of the saving in jute which this admitted of, was calculated to cause a measure of uneasiness. But again the buyers proved to be surprisingly acquiescent and fell in readily with the conservation program when once the reasons for the change had been explained.

Thus, taken all in all, the road of the fertilizer manufacturers here has been less difficult than they had feared, though it must not be assumed from this that they are moving along smoothly and that the way is clear. New complications are developing almost every day and the prevailing conditions call for the exercise of all of the resourcefulness of which the manufacturers are capable.

Diminishing Stocks.

That Baltimore has been able, in the face of these difficulties, to maintain its position of importance in the fertilizer trade is greatly to the credit of the members, who have shown themselves equal to every emergency. Foremost among these problems, as already referred to, have been the diminishing stocks of certain materials and the virtual failure of other supplies. Imports of stocks formerly an established element in the business have ceased or dwindled to wholly insignificant proportions. This made it imperative, if the volume of business was to be maintained, to find substitutes or open new sources of inflow. The quest for substitutes has not been conspicuously successful, though some progress has been made. Potash, for example, though not available in the forms in which it formerly reached the market, has been furnished in increasing quantities and in various combinations, with the result that the needs in the way of this important ingredient have been to some extent met. With foreign sulphate of ammonia cut off, the domestic production has made some headway, though the stocks available do not begin to cover the needs that would assert themselves with offerings at all free. Relative to some other materials it is to be said that the difficulties which made themselves felt were largely those of distribution, the government demands for certain materials also entering extensively into the question.

Animal Ammoniates.

As will be easily understood, the supplies of animal ammoniates could not be increased at will, the output depending of course, upon the activity of the meat packing houses, both here and in the West. It was inevitable, therefore, that any increase in pressure upon the market should result in a sharp advance in prices, this applying both to tankage and blood. The quotations on these ammoniates naturally carried bone along and in a way helped to fix the range for fish scrap. As to scrap, however, it is to be said that perhaps equally as important in dictating prices as the advance in other ammoniates was the unsatisfactory yield of the fishing season. The latter began at the usual time, but for weeks the weather proved unfavorable for the operation of the boats.

Fishing Boats Commandeered.

Besides, the government had stepped in and commandeered almost half of the fleet in Chesapeake Bay, taking the speediest and largest craft for patrol duty and leaving the smaller and slower steamers, reinforced with a few sail rigs, to take care of the demand for scrap from users of fertilizers who had been in the habit of purchasing fish mixtures. The combination of unfavorable weather and reduction of the fleet, together with real scarcity of fish, would have proved disastrous to the fishing companies if they had not been able to obtain prices fully double those under normal conditions. In addition—and this fact elicited special comment—the fish actually caught were exceptionally fat and yielded large quantities of oil, which brought excellent returns, the quotations on oil rising to 85 and more cents a gallon.

Nitrate prices were naturally affected by the circumstances that the government became one of the most active of bidders for supplies, and, in addition, a reduction in the tonnage available for the trade took place in the course of the year.

The extent to which the quotations on crude stocks have gone up is strikingly shown by the tables below, which give the figures for about the first week in each month during the year 1917. These figures show disclosure of the fact, moreover, that fish scrap, instead of fluctuating, has remained practically stationary throughout the months in which scrap constituted an important item in the fertilizer trade here. And it is further to be said that the figures are those quoted for down the bay at factory, instead of, as has been the case in previous years, including the freight to Baltimore, which makes them all the more attractive. The tables in question with "and 10" to be added to the figures for scrap and tankage are as follows:—

Price Ranges in 1917.

Tankage, Blood and Fish Scrap.

	Tankage, 11 and 15 ground.	Blood, ground.	Fish scrap.
January	$4.25	$4.20	....
February	4.42½	4.45	....
March	4.57½	4.55	....
April	4.67½	4.70	....
May	4.90	4.95	....
June	5.52½	6.62½	....
July	6.20	6.25	$6.50
August	6.15	6.50	6.50
September	6.46	6.42½	6.50
October	6.42½	6.37½	6.50
November	6.40	6.40	6.50
December	6.70	6.65	....

Acid Phosphate, Nitrate of Soda, Sulphate of Ammonia.

	Acid phosphate 16%.	Acid phosphate 14%.	Nitrate.	Sulph. of Ammonia.
January	$12.00	$11.00	$3.25	$4.75
February	12.00	11.00	3.35	4.50
March	12.00	11.00	3.75	5.25
April	12.50	11.50	3.75	5.50
May	14.50	13.50	3.85	5.75
June	15.50	14.50	4.00	5.75
July	16.00	15.00	4.20	6.15
August	16.00	15.00	4.25	6.75
September	16.00	15.00	4.30	6.75
October	16.00	15.00	5.00	6.75
November	16.00	15.00	5.00	6.75
December	16.00	15.00	4.65	7.00

Bone.

	4½ & 5 ground raw.	3 & 50 steamed.	2½ & 60.
January	$35.00	$30.00	$30.00
February	34.00	29.00	....
March	35.00	28.00	....
April	34.00	28.00	....
May	34.00	28.00	....
June	35.00	30.00	....
July	36.00	32.00	....
August	40.00	32.00	....
September	40.00	32.00	....
October	40.00	32.00	....
November	40.00	32.00	....
December	38.00	31.00	....

Imports to Baltimore Reduced.

In spite of the increased requirements in practically all directions the increasing lack of tonnage made itself felt in a diminution of imports, the single item of nitrate of soda showing some gain under the impetus of the government needs and the special efforts made to stimulate shipments. The aggregate tonnage is larger by about 57,000 tons, to be sure, but the total declared value of the imports shows an actual decrease, which is, of course, not to be attributed to a real shrinkage in value, but to a loss in certain receipts. The need for crude stocks of all kinds is perceived in the addition made to the imports of "all other fertilizers," but this gain is hardly of moment in view of the situation that existed. One feature of the business of supplying crude stocks is not shown in the import statistics for the reason that there was a switching from a material previously obtained almost exclusively from abroad to one brought here from other American ports. The two substances involved were pyrites and sulphur. The submarine menace and other causes having led to an almost complete suspension of shipments of pyrites from Spain, the manufacturers of sulphuric acid were obliged to look around for a substitute and switched to American sulphur. Italy would have been called upon to supply much sulphur, but the reasons which dictated the discontinuance of pyrites imports applied with even greater force to Italian sulphur. A number of large cargoes of sulphur have been brought here to keep the acid making plants busy, and when they are added to the total of imports, a very marked gain in the use of acid making materials will be shown.

Scarcity of Bottoms.

A similar gain in the receipts of phosphate rock might also have been recorded but for the progressive diminution of bottoms available for this trade, the breakdown of the railroads and the growing difficulties encountered by the makers of acid phosphate. These difficulties continue to exist, and in view of special demands made upon the acid producers must be regarded as very formidable.

The imports of fertilizer making materials by months at this port during 1917, the figures of the Baltimore Custom House being used, were as follows:—

Receipts of Crude Stocks.

Pyrites.

	1917 Tons.	1917 Value.	1916 Tons.	1916 Value.
Jan.	27,982	$195,902	37,692	$181,561
Feb.	20,681	220,758	29,108	177,743
March	10,712	51,824	23,489	136,324
April	4,895	20,971	13,884	85,440
May	9,642	41,123	31,619	155,216
June	4,593	28,773	17,167	110,512
July	10,770	38,808	13,652	108,361
Aug.	6,114	20,473	10,398	54,270
Sept.	10,702	51,426	6,849	97,300
Oct.	....	....	....	....
Nov.	8,401	29,474	12,767	80,152
Dec.	12,345	65,041	24,781	182,108
Totals	126,837	$764,583	221,400	$1,368,988

Nitrate of Soda.

	1917 Tons.	1917 Value.	1916 Tons.	1916 Value.
Jan.	6,570	$191,327	8,866	$216,862
Feb.	1,493	40,494	6,280	126,215
March	16,977	612,435	....	....
April	1,945	68,590	23,300	551,102
May	....	....	24,059	508,830
June	11,127	287,340	....	....
July	14,492	443,265	26,621	692,311
Aug.	12,825	361,126	....	....
Sept.	17,723	434,326	1,552	34,949
Oct.	18,816	462,479	....	....
Nov.	3,103	76,048	8,489	197,287
Dec.	8,279	203,115	6,682	193,699
Totals	113,350	$3,180,545	105,849	$2,521,255

Bone Dust and Bone Ash.

	1917 Tons.	1917 Value.	1916 Tons.	1916 Value.
Jan.	....	....	823	$16,633
Feb.	660	$6,410	....	....
March	162	3,082	....	....
April	....	....	....	....
May	173	2,997	....	....
June	....	....	....	....
July	....	....	....	....
Aug.	46	2,671	....	....
Sept.	....	....	....	....
Oct.	....	....	....	....
Nov.	529	17,819	....	....
Dec.	....	....	....	....
Totals	1,570	$32,979	823	$16,633

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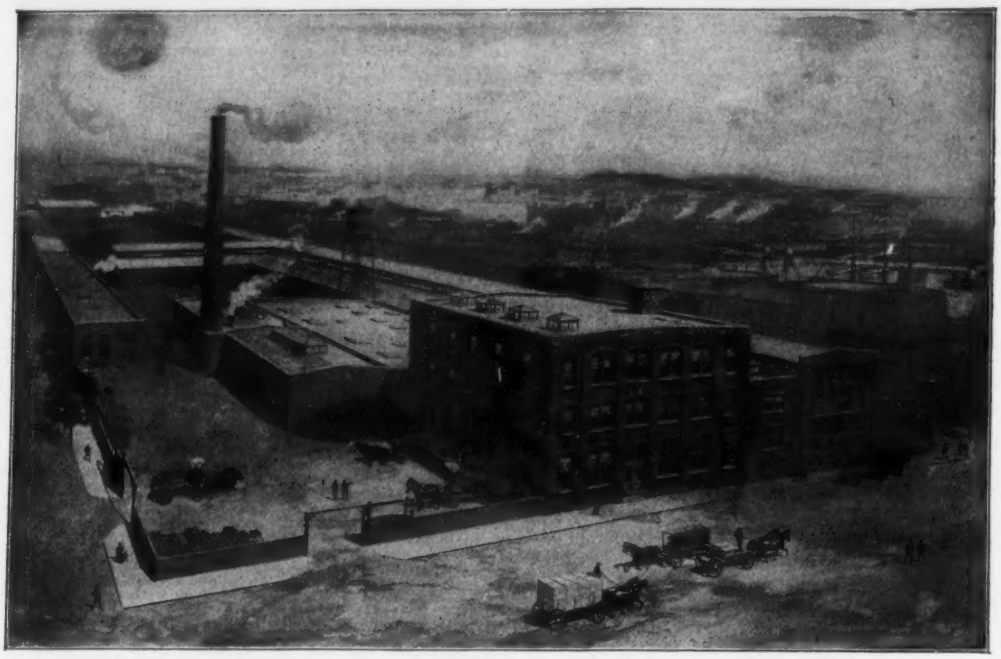

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Sulphate of Ammonia.

	1917		1916	
	Tons.	Value.	Tons.	Value.
Jan.	353	$31,901	280	$21,515
Feb.	74	6,904	503	38,911
March	....	....	....	....
April	....	....	....	....
May	....	....	148	11,097
June	....	....	78	5,779
July	....	....	....	....
Aug.	....	....	....	....
Sept.	....	....	....	....
Oct.	....	....	....	....
Nov.	....	....	....	....
Dec.	....	....	....	....
Totals	427	$38,805	1,008	$77,312

All Other Fertilizers.

	1917. Value.	1916. Value.
January	$6,119	$578
February	....	2,554
March	....	2,718
April	900	3,248
May	24,213	1,089
June	....	10,176
July	773	....
August	33,064	1,969
September	....	411
October	11,523	11,705
November	40,895	9,900
December	18,589	4,358
Totals	$135,076	$48,716

Imports of Fertilizer Materials for 1917, as Compared with 1916, Summarized.

	1917		1916	
	Tons.	Value.	Tons.	Value.
Pyrites	126,837	$764,583	221,400	$1,368,988
Nitrate of soda	113,350	3,180,545	105,849	2,521,255
Bone dust and bone ash	1,570	32,979	823	16,633
Sulphate of ammonia	427	38,805	1,008	77,312
All other fertilizers	.....	135,076	.....	48,716
Totals	242,184	$4,151,988	329,080	$4,022,904

Outlook for 1918.

As far as 1918 is concerned the outlook may be regarded as full of uncertainties, though it must also be borne in mind that the authorities are keenly alive to the situation and can be depended upon to take measures which will enable the manufacturers of mixtures to take care of the needs of the agriculturists in the way of plant food. The quotations at the end of 1917 were about equal to the highest, with little or no prospect of an easing off during 1918. The trade, however, had adjusted itself to the new bases and all the divisions of it were working together in order that the production of foodstuffs might not suffer. It was also to be said that while the manufacturers of mixtures experienced difficulties, a feeling of confidence prevailed that these would be met.

Of special interest to the trade, apart from the matter of producing and marketing fertilizer materials, was the litigation between the Baugh Chemical Company and the Davison Chemical Company, the Baugh Company having sued for damage on account of alleged breach of contract and also to enjoin the Davison Company from making delivery of sulphuric acid to anyone else before its own contract requirements were met. The Baugh Company failed to obtain damages, owing to a disagreement of the jury concerning the amount, although the largest sum any of the jurors voted to award the plaintiff was only a fraction of the total of the claim. In the effort to have the Davison Company enjoined the Baugh Company was more successful, an order to this effect being issued by one of the Baltimore judges. As the contract for the Davison Company with the Baugh Company has now expired by limitation, there remains to be disposed of only such litigation as involves claims for damages, and the end of this is at this moment not in sight.

A disastrous fire destroyed the plant of the Piedmont-Mount Airy Company in the latter part of the year and a contract has been placed for the erection of a building to cost $60,000 on the old site at Locust Point, this city.

The Davison Company changed a portion of its plant from a pyrites to a brimstone base in the manufacture of sulphuric acid, and the close of the year found it actively at work making the improvements that will, it is confidently predicted, enable it to draw a full supply of pyrites from the property acquired in the Island of Cuba.

A word may be added in regard to the readiness of the Baltimore members of the fertilizer trade to assume to the fullest extent burdens and responsibilities in order that the government might have the most competent advice and aid in the handling of the question of fertilizers from the standpoint of the national defense. Such men as W. D. Huntington, vice-president of the Davison Chemical Company, and others have given freely of their time and placed at the disposal of the Federal authorities their wide experience, to the end that mistakes might be avoided and the matter of keeping food production up to the requirements of the country met. The patriotism of these men will receive the highest commendation from all in the slightest degree familiar with the problem, and to the trade of this city belongs the credit of making most valuable contributions to the efficiency of the Washington authorities in the conduct of the war and the maintenance of the nation's efficiency.

ATLANTA FERTILIZER MARKET REPORTS GOOD YEAR, WITH HIGH PRICES A FEATURE

Consumption Fell Away, but Entire Industry Was Affected by Federal Demands for Bases, and by Freight Conditions.

Atlanta, Ga., Jan. 25, 1918.

Everything considered 1917 was a good business year with the fertilizer and material industry in the Southeast. While consumption fell far short of the high record, high prices prevailed with a corresponding percentage of profit and consumers generally were in position to meet their obligations in full and promptly.

High prices for materials, especially in the latter half of the year, largely eliminated the smaller manufacturers and mixers, so that the big concerns almost maintained their former normal volume of business, even at the increased prices they were compelled to ask for their product.

The food agitation in the beginning of 1917, together with the high price of cotton, were material factors in strengthening the demand for fertilizers, and the consumption in Georgia alone was over 133,000 tons in excess of that of the year before.

Even this was approximately 420,000 short of the record consumption in 1913-14 when fertilizers were selling around $20 a ton and the average farmer scattered it broadcast over his lands. Now he has learned his lesson in economy and he works his $50 fertilizer into the furrow, making 3 tons do the work where formerly he used five.

Yet equally good results were obtained, for production in Georgia in 1917 was far ahead of any other year in the history of the State.

Conservation Will Continue.

There will be still greater consumption of fertilizers in 1918, but the same conservation will be practiced. This increased consumption will mean larger acreage, especially in food products, and also a more intensive cultivation. There is no concealing the fact that many will yield to the temptation of 30c. cotton and plant every foot of available land in that product, nowithstanding the warnings against a possible food crisis; so that it may be accepted as true, as has been said, that every pound of available fertilizer will be taken this year and used.

Georgia Department of Agriculture records for 1917 indicate the consumption in this State during last year of 874,610.9 tons of mixed fertilizers and 63,655 tons of C. S. meal for fertilizer purposes. This is an increase over 1916 of about 133,000 tons of fertilizers, while the consumption of cottonseed meal on account of high prices was reduced nearly one-half. Georgia consumption for the last six years, as shown by the department records, has been as follows:—

Georgia Consumption.

	Fertilizers, Tons.	C. S. meal, Tons.
1912	1,103,864	121,236
1913	1,120,603	122,975
1914	1,282,098	148,281
1915	738,962.4	134,017
1916	741,347	110,262
1917	874,610.9	63,655

The "high grade" fertilizer in Georgia, under the ruling of the Department of Agriculture, must now be "10-1.65-2" or its equivalent. Manufacturers have been securing their 2 per cent. potash from various sources, such as Nebraska, sufficient to meet legal requirements in the'r product, the price having ranged during the year at $5 to $6 per unit. By far the larger majority of goods, however, have been sold without potash, the farmer depending upon meal, stable manure and other sources for it. Georgia analyses for 1917 show 983 of complete goods containing potash, 2,120 containing only phosphoric acid and nitrogen, and 969 of various other combinations.

Raw Ground Phosphate.

More favorable consideration has been given to raw ground phosphate rock, which has been used in considerable quantities, upon the understanding that only gradual returns might be expected from it over a period of several years.

Agricultural departments generally, heretofore conservative in their advice, are this year urging generous application of fertilizers, with due caution against waste, and are even pointing out that, compared with the present prices of farm products, fertilizers are cheaper than they have ever been in the history of the South.

Altogether, therefore, the trade is looking forward to a splendid 1918 season, with sales of every pound of their product assured in advance, and easy collections in the fall. This, of course, will be reflected in the material trade which is likewise anticipating a fine business year.

Market Opened Peculiarly.

The fertilizer material market opened in January, 1917, under rather peculiar conditions. Following the holiday lull there was considerable activity in a number of materials. There were larger sales of bag goods than in the year preceding, but the price was far below what was anticipated. This is said to have been brought about somewhat by the attitude of the large dealers who sought, as much as possible, to eliminate the small mixer. This being done through lower prices stimulated purchases in the latter part of January and early February. Prices of materials held up unusually well and showed much strength. The ammoniates were especially scarce and high in price. The price of cottonseed meal in latter January was very much strengthened by speculative deals in cottonseed cake on the part of exporters. Potash continued scarce with only small lots of Japanese offering around $6 a unit. There was some pyrites to be had, but it was getting very scarce on account of the lack of tonnage to bring it over.

February brought considerably more activity in the material market, on account of unusually heavy sales of bag goods. These sales were the largest known for a similar period within the past five years. Consumers were in good financial shape as the result of good crops and high prices and had plenty of money with which to meet their obligations. Many purchases had been made, too, for February delivery, on account of the fact that advances of $1 to $3 a ton were scheduled to go into effect the first of that month. Another factor entering into the problem was the car shortage which loomed up and threatened to interfere seriously with deliveries. During the month there was announced the shipment to Holland of 40,000 tons of acid phosphate by the Ashcraft-Wilkinson Company, aggregating something like $2,500,000. As this acid phosphate had been bought the preceding fall at the various ports the market was unaffected.

March Deliveries Delayed.

In the latter part of February and early March extremely bad weather prevented deliveries to the consumer and the result was a lull in the activity of the fertilizer market. The sales of bag goods fell off and this naturally affected the market in materials. Cottonseed meal weakened and for a time there was practically no demand. Acid phosphate fell off slightly, both interior and at the coast. The ammoniates held strong, many of them at purely nominal prices, as there were scarcely any to be had. There was no blood offering and tankage was hard to get at any price. Nebraska potash took the place of that from Japan at practically the same price, $5 per unit. Pyrites grew scarcer and scarcer until in the early spring it was impossible to get it at any price, due to the scarcity of shipping facilities.

The extremely bad weather continued during March and the car shortage became more and more serious, handicapping manufacturers and dealers at every point. Bag goods accumulated in the country stores and it was practically impossible to get them out to the farmers. Thus, in spite of unusually heavy sales early in the year, by the middle of March the manufacturers had shipped only about 35 per cent. of the season's estimated consumption, notwithstanding the fact that merchants and farmers everywhere were appealing for the goods. Shipments were cut down fully one-half on account of the car shortage and appeal after appeal brought no substantial relief. As a result of these conditions trading in materials was on a sort of hand-to-mouth basis. Cottonseed meal strengthened somewhat on account of large purchases by fertilizer people. Blood, tankage, sulphate of ammonia, continued very scarce, the market figures practically nominal. The nitrates advanced, showing more strength, while potash salts weakened somewhat, Nebraska selling at $5 a unit. There was no foreign pyrites in sight and the manufacturers began to look around for the best domestic product they could find.

Cottonseed Meal.

Cottonseed meal strengthened materially in April as the result of large purchases by manufacturers who had bought very sparingly of meal early in the season and had to have it to fill in with. Owing to market conditions and the scarcity of certain materials, the smaller manufacturers and mixers dropped out of the market entirely and this naturally affected the material trading. With the exception of bulk acid dealers had sold out everything they had made and it looked as if Georgia were going to consume some 15 per cent. more fertilizers than the previous year. Weather conditions had put the farmers considerably behind, especially in the middle and northern section of the State, so that shipments of bag goods continued entirely through April and into May. The demand for cottonseed meal as a stock food later in the month kept it strong, while the market figures on the other products varied but little from those of the preceding month.

May brought a close to the Georgia fertilizer season and the shipment of bag goods practically came to an end except for some small orders in the northern section of the State where planting is usually late. Trading in bulk acid for the next season began early in May and large sales were reported for a time. This strengthened the market which went up from $10 in April to $11, and then to $12 in May, both at interior and coast points. May also saw some trading in nitrate of soda which gradually advanced during the month from $3.60 to $3.85 for future delivery. Cyanimid, which sold at the beginning of the year at $2.79, advanced gradually to $3.25 in May, plus bags at current prices. The situation as to pyrites was getting worse as there was none of the imported to be had at any price. As a result there was a meeting held in Atlanta in May by prominent fertilizer manufacturers to determine upon some means of obtaining pyrites. Although no definite arrangements were made, plans were put on foot to secure the best possible domestic product for manufacturing acid for the following season.

Scramble for Ammoniates.

Although June is usually a quiet month in the material market, June, 1917, presented the unusual feature of a scramble for ammoniates far ahead of the usual time of buying. They were at that time very scarce and there was every indication that they would be still scarcer as the season went on. Manufacturers at that time were buying all the ammoniates they could lay hands on and still could not get enough. The month witnessed extraordinary trading in cottonseed meal, which shot the price up rapidly, first to $38.50 and then to $42, with every indication that it would go still higher. At this time all materials began to advance rapidly. Blood shot up from $4.70 in May to $5.75 in June, and tankage and fish guano took similar spurts. Acid phosphate reached its highest point, while sulphate of ammonia climbed to $6.25, and nitrate of soda went up to $4. Almost everyone who had any ammoniates of any sort sold them out. Fish guano and sulphate of ammonia were quoted, but at purely nominal prices, and there was very little of them to be had at all. Cyanimid was reported sold out up to January and no prices were made, although it was said that $4 might buy a few small re-sale lots.

There was then every indication of the fact that bag goods would go the next season to the highest price in their history, yet cotton at that time was selling at 25c. a pound and it was generally felt that farmers would willingly pay $50 a ton for fertilizers rather than not have them at all. Materials of all kinds in large lots became unobtainable. Everything available was immediately seized upon. Domestic pyrites began to appear, but the grades varied so much that no market figures were available. The month was an unusual one with the trade and indicated further advances during the remainder of the year.

Federal Demands.

In several lines these advances were due to the demand created by the Federal Government for nitrate and other materials in the manufacture of explosives. It was stated that the Federal Government had taken the entire remaining balance of the output of cyanamid, and to its use of nitrate of soda was ascribed the advance in price of that product. There was continued activity in the material market in July, although buying fell off to a considerable extent on account of the rapid advance in prices of nearly all materials. Cottonseed meal jumped up again, going to $44, and all the ammoniates continued to advance. Anybody who had anything that could be used at all was able to get a good price for it. The month witnessed some extensive trading in nitrate of soda for future delivery and a large amount of meal was bought for fall shipment up to January 1. Although practically frozen out the season before, the small manufacturers and mixers began to get into the market and bought about 50 per cent. of their requirements in acid phosphate and one or two other materials. Many of them, however, took the position that if the market held up at the prevailing high prices they would not be able to do any business, as the bag goods could be bought cheaper than they could make them. July indications were that bag goods would sell anywhere from $6 to $10 a ton higher than the previous year. Early season quotations were made at that time and on that basis by some of the larger manufacturers. Cottonseed meal held its own around $44, though it dropped to $42.50 for a short period. A large amount was contracted for. The price of Nebraska potash settled down at $5.25 a unit, which was fairly well maintained into the fall.

Usual Lull in August.

August brought a lull in the material market in this territory and for some weeks the situation remained at a standstill. Factors entering into the situation at that time included Congress and the food administration bill, the price of coal and the high prices at which materials were selling. Trading in acid phosphate fell off and prices showed a slight decrease. Many of the small manufacturers and mixers were still holding off, believing that prices would go lower, but they were destined to disappointment. Cottonseed meal strengthened materially and continued to advance. Fertilizer people took very little of it in August, but feed men bought it liberally because of the high prices of grain. Crop conditions were fine and an unusually large production was indicated. This, of course, had a tendency to strengthen the fertilizer market and prices throughout the list held up in spite of an absence of trading. Blood and tankage continued to be quoted, although the prices were purely nominal. The only thing to be had in this line, however, was some small lots of 6½ and 30 tankage which was priced at $46.50 per ton. Cottonseed meal continued strong until the latter part of the month, when the large cotton crop resulted in a weakening of the price for new meal to $41.50. But this lasted only a short time. It soon went back to $45. There was no abatement in the scarcity of materials. Some Kansas City potash was quoted the latter part of the month at $4.85, while the Nebraska remained at $5.25. Phosphate rock, which had been selling at $1.75 all the year up to this time, advanced to $2.25 at the Florida mines, and held that figure through the remainder of the year.

Still Dull in September.

September opened with a continued dull market and the same waiting attitude, notwithstanding which dealers and brokers were more hopeful than ever. Georgia had made magnificent crops and cotton and everything else were bringing extraordinarily high prices. The outlook was better than ever for a big business in the late fall and spring, and inquiries about materials began to be very numerous. The latter part of September saw considerable trading in bulk acid, nitrate of soda and cottonseed meal. The Federal Government had confiscated several cargoes of nitrate of soda and this material shot up to $5 at the ports, although some small re-sale lots were offered at $4.60. Buyers were slow in entering the market, notwithstanding which prices of materials which experienced some depression during the lull began to advance. Acid phosphate went to $14 interior and coast. Otherwise the market remained about as it had been during August.

October More Optimistic.

Uncertain conditions prevailed during October. With cotton advancing rapidly toward 30 cents a pound, it was evident

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that growers would be in a position to pay the high prices for bag goods the coming season. In fact, it was generally remarked over the State that notwithstanding the high figures at which goods would be sold a bale of cotton and a bushel of corn would buy more fertilizers than ever before in the history of the South. An optimistic feeling prevailed. Cottonseed meal weakened somewhat during the month, selling at $42, and then shot up as high as $48 a ton, although very little was taken at that price in this territory. The ammoniates and acid phosphate continued strong at about the same prices as prevailed in the previous month.

Car Shortage Again.

An increase of optimism with regard to the season just ahead was noted in November, when the annual meeting of the Southern Fertilizer Association was held in Atlanta the first of the month. This meeting brought together a large representation from all parts of the South and the general impression among the manufacturers was that they would have a market for more fertilizers this year than they could possibly make. They were looking forward to high prices, and representatives of several factories stated their concerns had sold their entire output before the season was half over. The one gloomy spot in the whole situation was the car shortage which looked as if it was going to be very serious. On this account manufacturers put forth their utmost efforts to get their customers to order their goods and have them shipped just as soon as possible, so as not to take any chances on failure of delivery later on. Money was plentiful throughout the country and indications were that much of the business would be done on a cash basis. The material market was not very active, although there was a good deal of trading in nitrate of soda. Manufacturers had bought nearly all the supplies they needed and about the only outlook was for filling in orders. Cottonseed meal prevailed strong at $46 and $48, Atlanta, while other materials held their own, and some of them could not be obtained at any price.

December brought a little more trading in materials up to the holidays, chiefly, however, in nitrate of soda and bulk acid. Considerable nitrate of soda was sold at the resale price of $4.60, while the importers were slightly higher. The efforts of the Federal Government to adjust the cottonseed product situation finally resulted in a meeting in Atlanta of the Cottonseed Crushers with representatives of the Federal Food Administration, at which a maximum price of $47.50 per ton was agreed upon for cottonseed meal, f. o. b. shipping point. This figure applied both to Georgia and Alabama. This, of course, established the market quotation at $47.50, although December saw little trading in that material, because buyers felt it was too high and that they would later be able to obtain it at less. Market quotations on blood and tankage took another upward shoot and fish guano followed. It became known that there would be no more cyanimid for fertilizer uses for the next twelve months, as the Federal Government had taken the entire output for explosives. Acid phosphate held its own at $14 interior and $13.50 coast. Nebraska potash continued to sell at $5.25, while Kansas City had advanced to $5.10. Domestic pyrites of fair quality began to appear on the market and sold somewhere around the old price of the imported product; but it was not handled to a sufficient extent here to create a definite market.

In the following table is given the range in prices of cottonseed meal, bulk acid, sulphate of ammonia and nitrate of soda for the months of the year 1917. The prices in the table below are the highest prices that ranged during the month in question. The price of cottonseed meal is given on a basis of Atlanta. Two quotations are given on acid phosphate, the first being that at interior points and the second that prevailing at the coast. Sulphate of ammonia is quoted on a basis Atlanta. The quotations on this product for the latter half of the year are practically nominal on account of scarcity. The quotations on nitrate of soda are given at the vessel side at the South Atlantic ports. The table showing prices on the foregoing products follows:—

Prices for the Year.

	Cottonseed meal.	Acid phosphate.	Sulphate Ammonia.	Nitrate soda.
Jan.	$36.50	$12.00—$12.00	$4.00	$3.25
Feb.	35.00	11.00— 11.00	4.60	3.25
March	34.00	10.50— 10.50	4.60	3.55
April	36.00	11.00— 11.00	4.60	3.45
May	36.00	12.00— 12.00	4.60	3.75
June	42.00	14.50— 13.50	5.25	4.00
July	44.00	14.50— 13.50	6.00	4.20
Aug.	45.00	14.00— 13.75	6.00	4.25
Sept.	45.00	14.00— 14.00	6.00	4.75
Oct.	45.00	14.00— 14.00	6.50	5.00
Nov.	48.00	14.00— 13.50	6.50	4.75
Dec.	47.50	14.00— 13.50	6.50	4.60

The animal ammoniates kept pace with all other materials during the year, advancing rapidly, especially in the latter half of 1917. The big jump came along about the first of June and was reflected in the quotations for that month. Unusual scarcity prevailed in these materials and at times it was impossible to get them at any price. In the following table showing monthly prices of the animal ammoniates, blood and tankage are quoted on a basis of Atlanta, while fish guano is quoted chiefly at Norfolk and other Atlantic ports, depending upon the source of supply. The highest prices prevailing in each month respectively are given in the following table:—

Animal Ammoniate Price Range.

	Blood.	Tankage.	Fish guano.
January	$4.25	$4.60 & 10	$4.25 & 10
February	4.25	4.60 & 10	4.25 & 10
March	4.70	4.60 & 10	4.35 & 10
April	4.70	4.75 & 10	4.35 & 10
May	4.70	4.75 & 10	4.10 & 10
June	5.75	5.75 & 10	5.50 & 10
July	6.00	6.00 & 10	6.50 & 10
August	6.00	6.00 & 10	5.50 & 10
September	6.20	6.20 & 10	6.00 & 10
October	6.20	6.20 & 10	6.50 & 10
November	6.50	6.50 & 10	6.50 & 10
December	6.95	6.95 & 10	6.50 & 10

Potash salts, which were practically unavailable in 1916, continued scarce in 1917, although potash began to appear from various sources, chiefly in the West. With the beginning of the year there were some small lots of kainit and muriate offered from Japan at $6 per unit. This was soon taken and then the Nebraska and Kansas City potash came on the market at $5 per unit. These continued to be offered during the year around $5, the quotations at the close of the year going to $5.25 for Nebraska and $5.10 for Kansas City. During the year several plants were established undertaking to manufacture potash in this territory and have met with some small success. A plant established in Polk county in this State succeeded in making a 4½ per cent. product in December, with the prospect of running considerably higher this year.

Cyanimid and Phosphate Rock.

Cyanimid opened in the beginning of 1917 at $2.79, but soon advanced to $3.25, and some small lots were sold as high as $5.80 in this territory, even after the government had taken over the output of the Niagara Falls plant.

Phosphate rock sold at $1.75 Florida mines up to July, when, along with the advance in other materials, it went to $2.25. Pyrites sold first at 15c. and then at 16c. per unit of sulphur until about March 1, when the foreign product disappeared from the market and the work of finding a satisfactory substitute in domestic mines was undertaken.

CHICAGO FERTILIZER MARKET FOR 1917 ONE OF RECORD-BREAKING PRICES AND DEMAND

The year 1917 will long be remembered in the fertilizer industry of the country as one of record-breaking prices and demand. The demand for commercial fertilizers was better than ever before in the history of the industry, and as a result the demand for fertilizer-making materials was unprecedented.

It was a year in which every fertilizer plant in the country and the fertilizer material department of every packing house in the country increased its production to the highest limit set by the amount of materials available, and yet there was a chronic scarcity of supplies throughout 1917.

Factors in Demand.

Chief among the many factors that induced this extraordinary demand were:—

1. The fact that farmers were assured $2 wheat, which led them to cultivate as much ground as possible and to enrich it as much as possible.

2. The fact that the highest prices on record were paid for hogs, which induced farmers to use tankage for feeding purposes to a greater extent than ever before.

3. This diversion of fertilizer-making material, the scarcity of labor and coal and the unsettled transportation situation that existed during the greater part of the year all made for a shortage of animal ammoniates.

Limiting Production.

Chief among the factors that tended to limit the production of fertilizer-making materials were:—

1. The unprecedented diversion of animal ammoniates and garbage tankage as feedstuffs for hogs.

2. The shortage of labor, fuel and transportation facilities arising from our active entrance into the war with Germany.

3. The reduction both in quality and quantity of the garbage collections as a direct result of the Food Administration's food economy campaigns.

This combination of low supplies and heavy demand sent the price of all animal ammoniates to heights which probably never were dreamed of in former years. A curve representing the course of blood and tankage during the year would have an almost unbroken upward trend, the only breaks in the market being very brief in duration and slight in amount. A 5-cent drop is noted in tankage from December of 1916 to January of 1917; another 5-cent drop occurred during the latter part of April, 1917, and a slight easing was felt once or twice in the fall. But with these exceptions high-grade ground blood rose steadily from $3.80 per unit of ammonia in January to the vicinity of $6.50 per unit of ammonia in December, and the price of high-grade ground tankage rose only 5 to 10 cents behind that of blood all through this period.

It is interesting to note that the margin between blood and tankage this year was smaller than ever. Whereas this margin was around 5 to 10 cents throughout 1917, it averaged around 40 to 50 cents throughout the greater part of the preceding ten years.

Potash Requirements.

One development of the year which probably will have a permanent effect on the fertilizer market even after the conclusion of peace is the realization by American farmers that their soil does not need nearly so much potash as the potash propagandists of Germany had led them to believe before the war. It appears now that a great deal of the money that was spent for fertilizers containing large percentages of potash was wasted.

One of the biggest fertilizer manufacturers in this section of the country declared that, whereas before the war certain of their most popular fertilizers contained as much potash as 10 per cent., and the average was around 5 per cent., the average percentage of potash in the fertilizers of today is between 2 and 3 per cent. and the farmers are finding these fertilizers just as satisfactory and productive of the same yield.

In view of this state of affairs, and in view of the increased production of potash in the United States, it is highly probably that the importation of potash from Germany to the United States after the war will be greatly below the prewar importation. In fact, it would be not at all surprising if such importations fell to a negligible amount or ceased altogether.

Sulphate of Ammonia.

Because of the decreased receipts of sulphate of ammonia from England, the production of that commodity was considerably increased here during 1917. The production of acid phosphate was curtailed considerably by the falling off in receipts of phosphate rock from Tennessee during the transportation difficulties of last spring, and again in the fall, and this proved another factor in limiting the production of commercial fertilizers.

Because of the shortage of all classes of ammoniates the unit of transaction fell from 500 tons to 100 early in 1917, and toward the close of the year most trading was done in units of 25 and 50-ton lots.

The scarcity of other ammoniates drove fertilizer manufacturers to ammoniates which heretofore had long been considered drugs on the market. Among these were hoof meal and dried peat.

Shortage of Ammoniates.

In the face of an increased production of blood and tankage last year there was a constant shortage of these ammoniates. The proportion that was sold as digester hog feeding was unprecedented, as it was the farmer's desire to obtain quick maturity for his hogs, so that he could market them at the top prices. The farmer found that tankage supplied the protein which, with the fat given the hog by corn, prepared the animal for market much more quickly, and some believed more cheaply, than other forms of feeding. Under these conditions digester tankage sold up to $95 a ton at the close of the year.

In the shortage of blood and tankage fertilizer manufacturers turned to nitrate of soda, hoof meal, concentrated tankage and all the rougher ammoniates more readily than in former years. The year saw a better interest in dried peat, which hitherto had been little used as fertilizer. It is claimed that sales of this ammoniate were made at prices as high as $4.50 delivered at Baltimore.

Greater activity was witnessed at the peat fields near Mantio and Morristown, Ill., and it is understood here that quite a few fertilizer factories in New Jersey are showing a strong interest in dried peat.

Perhaps the most popular substitute for blood and packers' tankage during 1917 was garbage tankage. Never before was there such a demand for this ammoniate. The prices paid for garbage tankage not only exceeded those of any previous year, but were far beyond the early expectations of any one in the market.

Garbage Tankage.

In the fall of 1917 garbage tankage sold up to $5 per unit of ammonia, plus 10 cents per unit of b.p.l. and $1.50 per unit of potash. In 1916 it was readily available at $3.25 per unit of ammonia, 10 cents per unit of b.p.l. and $1 per unit of potash.

Naturally, the good demand for this ammoniate and the high prices offered stimulated a maximum production, but the supply of garbage tankage-making material was decreased considerably by two factors:—

1. The Food Administration's conservation campaigns.

2. The growing use of the garbage incinerator in homes, public eating places and institutions.

The gas companies of the country during the last year discovered a very fertile field for gas consumption in the home and store size incinerators. Consequently extensive sales campaigns were launched to spread the use of these appliances. Toward the close of the year, however, the waste conservation committee of the Federal Food Administration began a nation-wide campaign for the greater utilization of garbage for grease and tankage rendering purposes. A committee on this subject estimated that millions of dollars' worth of glycerine, garbage tankage and soap stocks could be obtained from the garbage that was being incinerated at some army camps and by smaller municipalities that had no garbage reduction plants. Steps were taken to stop the burning of garbage in all cases where it could be sent to a reduction plant, and when that was not possible the government advocated the use of garbage as hog feed.

Bones and Hoofs.

The strong feeling that characterized the general ammoniate market was also prevalent in the bone and hoof market. The glue market was stronger than ever before throughout the greater part of 1917, about the only period of weakness coming in December when bones dropped $10 to $15 a ton. Due to the many new outlets for glue resulting from our entrance into the war, bones of all sorts were in strong demand.

The same situation was apparent in the hoof market. The better grades met an extraordinary demand from the manufacturers of buttons for army uniforms, while the poorer qualities were eagerly sought for grinding purposes.

A factor that tended to weaken the entire fertilizer market and the nitrate of soda branch in particular was the announcement by the government that it had purchased 100,000 tons of Chilean nitrate of soda and would sell it at $75 a ton to farmers at the port of entry.

PHILADELPHIA FERTILIZER TONNAGE THIS YEAR MAY NOT EXCEED HALF THE NOMINAL

The year 1917 has been an eventful one in the fertilizer business, with a continued growing scarcity in all commodities entering into the manufacture of fertilizer.

Tremendous quantities of acid have been required for the production of munitions and in other necessary lines of work, and prices have advanced from 250 per cent. to 500 per cent., as compared with normal figures.

The supply of German potash salts has become exhausted during the year and the last sold at approximately 900 per cent. advance over normal figures. To supplement the potash supply various by-products have been utilized from different sections of this country. Flue dust and dust from cement kilns running from 6 per cent. to 10 per cent. of water soluble potash have been utilized with good results in the manufacture of fertilizer. In addition to this, California kelp beds have been developed extensively, and are now producing considerable potash material running from 25 per cent. to 30 per cent. actual potash. Alunite deposits at Marysvale, Utah, have also supplied considerable potash salts, but the most prolific production has been in the Nebraska fields from the inland lakes, where very large quantities of potash salts have been produced during the year, running from 26 per cent. to 30 per cent. of water soluble K_2O. These have given very excellent results in the fertilizer trade, and the demand has been sufficient to take care of the entire supply, though the latter has been greatly increased.

The supply of available ammoniates has been very much curtailed, owing to the diversion of large quantities of tankage and blood into cattle food and the price of ammoniates has advanced from $3 to $3.30 a unit to from $6 to $6.75 a unit.

Phosphate rock seems to be the one commodity entering into fertilizer that has not advanced much in price, though the cost of handling it has gone up considerably in view of the necessity of transporting it by rail as compared to water transportation heretofore, there being no vessels available at the present time to transport this rock.

It is estimated that the turnover for the spring of 1917 was fully up to normal in tonnage and was comparatively little interfered with by transportation difficulties. There were, however, many contracts for raw materials which were not filled on time, and consequently much buying during the spring season to fill orders.

The prices for the spring of 1917 were at an advance of approximately 20 per cent. to 25 per cent. over previous prices, but during the latter spring months many of the goods were withdrawn from the market owing to the fact that their cost of production was higher than the published list. The advance in the price of fertilizer for fall was approximately 30 per cent. over the spring figures, but this did not interfere with the normal movement and tonnage.

At the present time the 1918 business is engaging our attention. The indications are that on account of the transportation difficulties, the shortage of available labor, scarcity of certain raw materials, the cost of buying by farmers at the present high prices, and the decrease of the farmers' help by enlistment and draft, the tonnage will be from 50 per cent. to 75 per cent. of normal. No business is operating under greater handicaps to-day than the fertilizer trade, which suffers most severely on account of the seasonable character of its business. Fertilizer undelivered when the farmer is planting is never shipped, and between securing the raw materials contracted for, the making up of these raw materials into finished goods, and the delivery of these same goods through the various railroad embargoes, the fertilizer manufacturer will well earn any profit that he may be able to show under the present abnormal conditions. Even burlap bags, which normally are worth 7½ cents a piece, are now being quoted at from 30 to 35 cents each. It has been estimated that the capital requirements of the fertilizer business are from 250 to 400 per cent. of the normal requirements.

Coconut Bud-Rot Disease Threatens Valuable Plantations in Cuba.

The average annual production of coconuts in the Baracoa district of Cuba for the three-year period ended December 31, 1917, is estimated at approximately 8,000,000, reports Consul H. M. Wolcott, of Santiago de Cuba. The production in 1917 fell to about 7,000,000, of which 4,500,000 were classified as "selects," and approximately half of this number were exported to the United States, the declared value being $124,034. The remainder of the selects were shipped to Havana and other sections of Cuba. The remaining 2,500,000 coconuts produced in 1917 were classified as "sprouts" and "cracks," and were ground for oil in the local mill, producing about 400,000 pounds of coconut oil valued at $60,000.

Practically all of the oil produced is now sold in Havana and Camaguey, principally for use in the manufacture of soap.

The January 31 quotations for "select" coconuts were $35 to $37 a thousand f. o. b. vessel Baracoa, and for oil 17 to 19 cents per pound, according to quality.

The coconut bud-rot disease which became prevalent in the Baracoa district in 1904 has reduced the production nearly 50 per cent. Some effort has been made by the Cuban Department of Agriculture to discover effective means for combating the disease, but thus far no remedy has been found. The disease has been checked to some extent by destroying trees by fire immediately when found to be affected. It now appears that unless some remedy is discoveed which will prevent the spread of the disease, the valuable plantations in Baracoa and other sections of Cuba will be completely destroyed in a short term of years.

Chicago Linseed Oil.

The price of linseed oil at the Chicago market during 1917 ranged from 90 cents a gallon in February to $1.25 a gallon in December. Larger quantities were sold to the soap makers than ever before because of shortage of animal fats and the prevailing high prices for all animal and vegetable fats. The big feature of the year was the sale in November of about 10,000,000 gallons, or the product of 4,000,000 bushels of flaxseed, to soap makers at around 95 cents a gallon.

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DRUG MARKET CONDITIONS IN 1917 RADICALLY AFFECTED BY REGULATION

Federal Control of Manufacture, Foreign Shipment and Domestic Distribution Led to High Prices—Many Foreign Commodities Unobtainable—Birth of Domestic Substitutes Brought Some Relief.

Briefly expressed, the business year of 1917 proved to be one of high prices, firm markets, shrunken stocks, and quotation-advancing tendencies. Of course, there are items to be found in any list of materials represented in the drug and allied markets to which the above general premise will not apply. Such items are the exceptions which but prove the general rule.

The conditions which prevailed during the first part of the year were colored by the possibility—to the keen analyst of international affairs, the certain eventuality—of the United States entering the world-war as one of the allied nations. The position of the United States as a supply medium for the entente countries had brought about an era of relatively high prices during the proceding year. Uncertainty as to the future course of this country could but bring about a lull, a waiting of anticipation, a slight suspense of usual commercial vigor.

This condition of affairs evidenced itself in a market whose undertone revealed marked firmness but which was quiescent in its potential strength. War was declared in April, 1917, and within a comparatively short time it became clear that the requirements of the government would put industry and transportation to severe test. Slowly the machinery whereby all manufactures would be subjected to governmental supervision and control was originated. The formation of the War Trade Board was one of the first positively constructive mediums of this control. This board proceeded to bring into being a series of associations representative of various trades and through the associations control and instruct trades generally. A partial list of such associations directly affecting the drug interests includes the Chemical Alliance, Oil and Oil Seeds Association, the American Castor Bean and Oil Association, Inc., and the United States Shellac Importers' Association, Inc.

Regulation of Foreign Trade

In the course of the year, the President issued a proclamation which prohibited the exportation or importation of certain articles except under license secured from the government. Included in this list were chemicals, drugs, and pharmaceuticals. The aim of the government in these cases was to prevent the movement of large quantities of materials to neutral countries who were indirectly supplying Germany with these or similar articles, to assure the United States of ample supplies for its own military needs, to prevent the transportation of non-essential commodities, thereby releasing cargoes space for the large group of essentials, and to bring the industry into such a position as best to serve the United States and her Allies in their principal business of the moment—the winning of the war in the shortest time possible.

Railroad Congestion

The results attained by this partial restrictive measure were not as great as was anticipated by the government. The situation so far as shipping bottoms was concerned was bettered to some degree however trifling, and of course materials of immediate concern to the government were held within the country. But the railroad transportation affairs suddenly thrust themselves forward as constituting an acute crisis of national concern. Although signals had not been lacking of the impending dangers, they were either ignored or overlooked by hydra-headed authority. The net result of it all was a congestion in railroad circles which utterly tied up the expeditious movement of freight—and this included coal, an element vitally needed by ships loaded for foreign ports with much needed cargos.

To solve the difficulty, freight embargoes within the country were imposed and the Fuel Administration issued its mandatory order for heatless and workless days. Further, in February the President issued a proclamation extending his former partial restrictions of importation and exportation to a blanket prohibition of movements of any material of any type whatsoever except under license obtainable only from the Federal government. All articles of commerce were affected by this extension of export-import prohibition by requiring licenses to move any material in or out of the country.

Food, Fuel, Freightage.

Eventually, the situation simmered down to a threefold problem—food, fuel, freightage. With the last the drug interests were intimately related. Despite the crowding of construction of bottoms both in this country and in England, the shipping destroyed continued to be in excess of building. This construction of cargo carriers and cargo space brought out conditions in the drug trade which bordered on near-exhaustion of reserves.

Effect on Botanicals.

Especially was this felt in the botanical group. Conditions at the source of domestic and foreign supply were bad enough during the crop-gathering season to cause considerable dismay on the part of sellers. But however hard such conditions proved to be, they were infinitsimal compared with the lack of shipping space and well-functioning railroad service. The net result of this was to bring out the low-stocked condition which prevailed throughout the country. With demands steady and regular, if not vigorous and strong, prices advanced all along the line. A partial list of botanicals which illustrate this would include cascara sagrada bark, cinchona bark, wahoo bark of tree, cubeb berries, calabar beans, belladonna root, iptcac, jalap, golden seal, nux vomica, cloves, mustard seed, all forms of peppers and Mexican sarsaparilla.

Domestic Growth Fostered.

Finally, among the many results of the shutting off of foreign botanical supplies has been the movement toward domestic cultivation of such of these supplies as may be grown in this country. The Federal Government has taken an increasing interest in the building up of new enterprises, and not the least among these to receive government aid has been the work of replacement by domestic cultivation of the foreign botanicals the supply of which is at present shut off by the war. A few of these botanicals include digitalis, belladonna leaves and root, canabis, henbane, and castor beans.

Raw Material Shortage.

The general conditions which prevailed in the botanical group were also operative in those of drugs, pharmaceuticals, and chemicals entering into the preparation of medical supplies. In these fields the shortage in raw materials brought out the rise in prices for finished products. Particularly was this true with reference to preparations in which mercury is a base. The shortage in this case had to do with a raw material whose production was greater during the year 1917 than for any of 42 previous years. The preparation of narcotics was seriously jeopardized by the small supplies of gum opium which entered during the year. The rise in price was a natural result, especially for materials held by second-hands, who in many cases were the only source to which buyers of material for immediate delivery could turn to supply their pressing needs.

Narcotic Legislation.

In connection with narcotics, a word as to what the Whitney Narcotic Committee of the State Legislature accomplished may be of interest. A series of hearings were held in the City Hall, New York. Testimony was taken from several groups. Several hundred addicts appeared and rendered statements as to how they became addicted to the use of habit forming drugs, what attempts they had made to arrive at a cure, and particularly the benefits received by them from treatments in private institutions making the treatment of addicts a specialty. Physicians also appeared before the committee and testified as to ways and means for the cure of drug addicts. It can not be said that their testimony was very convincing. Lastly, officers in whose hands rests the enforcement of the Harrison act and the Whitney law, passed at the last session of the Legislature, appeared and stated the position of their group to the problem under consideration. Summarized, the hearings established the following points:

First.—That addicts in a vast majority of cases are the result of medication.

Second.—That they are not criminals per se; that their statements are trustworthy and in most cases reliable.

Third.—That many, if not most, of the private institutions for the treatment of drug addiction are fakes; that patients leave not only not cured but also wrecked in mind and body, and that their principal benefit seems to accrue to themselves through the mulcing of their helpless patients.

Fourth.—That the medical profession know little about the matter beyond the effects of drug addiction. As to cure, they have devoted little time or study to the disease which prevails largely by reason of their medication.

Fifth.—That officers of the law feel the "possession clause" in the Whitney law is one of the most potent factors in their possession; that the Harrison act needs amendment in this connection; and, also, that some legislation ought to be enacted whereby the dishonest doctor would be unable to operate. In this connection, a central bureau for drug addict treatment was suggested.

Of these points, it seemed that the doctors responsibility in creating drug addiction and their utter lack of knowledge as to curative measures, and the situation having to do with the existence of the fake cure, the money-making mill flaunting itself as a sure and certain haven where the unfortunate drug addict would be painlessly and assuredly cured of his affliction, were the most importnnt and had a direct bearing on the main purpose of the committee. From the testimony submitted by the addicts themselves as well as by members of the medical profession, it seemed certain that the only thing such institutions succeeded in accomplishing was the reduction of their patient's bank accounts and—this in most cases by means far from painless—and the completion of what drug addiction had started—entire wrecking of the patient's health of mind, body and spirit. At the end of the year, the committee was considering legislation which would relieve these conditions and which would provide proper treatment for the drug addict if such treatment can be found. It was also stated authoritatively that no action was contemplated by the committee with reference to the abolition of the manuacture o heroin—a measure advocated to the committee a year ago and also during the course of the hearings in 1917. This action is likely to be taken sometime in the near future, but at present the Whitney committee is chiefly concerned in discovering ways and means for the proper care of the victim of habit-forming drugs.

High Prices Prevailed.

Looking further into the field of drugs and pharmaceuticals, it is easy to see examples of the situation created by raw material shortage coupled with a growing demand. High and mounting prices have ruled in every direction and any exhaustive list of articles so affected would include ethyl alcohol, castor oil, caffeine, cod-liver oil, corn syrup and sugar, coumarin, epsom salts, glycerine, Haarlem oil, all of the mercurials, paraffine, permanganate of potash, quicksilver, quinine in second hands, saccharine, sugar of milk, thymol, and toluol. This list is partial, is incomplete, and could be amplified ad infinitum. But it is representative of market conditions which existed practically throughout the entire year.

Seizure of German Patents.

Notwithstanding the interesting developments which, from a sales standpoint, featured the market continuously, there were new phases of manufacturing which were quite as interesting and may in the end prove to be of far reaching effect. After much agitation of the proposed intention German patent rights in this country were seized by Federal action and through the Federal Trade Commission licenses to manufacture and sell products which hitherto had been controlled by enemy aliens under American patents. In the line of drugs and pharmaceuticals, production of salvarsan, veronal, and novocain was allowed under authority of the act which assumed control over these and other patented items. Coincident with the issuing of these permits, the materials were renamed. Veronal is to be known as "Barbital," and novocain as "Procaine." The use of the older names is permitted for purposes of explanation. The government also vested in the Federal Trade Commission the right to fix the prices at which these and others may be sold. The pre-war price for veronal was $21.50 per pound and under war conditions the price was advanced to $40 per pound. It is to be manufactured under the new arrangements for $26 as a production figure and a profit of 15 per cent. is added. The pre-war price of novacain—now known as procaine—was $52 per pound, but the last sale previous to the government action outlined above was on the basis of $720 per pound. It is estimated that the material can be produced for $65 per pound and will be marketed at $95.

Examples of Federal Paternalism.

The above shows clearly the beneficial results of the government's action. Other proceedings on the part of Washington are quite as revolutionary. During the year it became necessary for the production and distribution of certain articles of immediate concern to the government's war ventures to be controlled and a supply assured.

This brought out the commandeering process which was freely exercised in the drug and chemical field. Among other articles over which Federal authority assumed arbitrary control were alcohol, acetate of lime, acetone, ketone, ammonia, sulphur, and toluol. Not an ounce of these materials may be disposed of in any manner, shape or form without government order and then only after the presentation of documents showing the use to which the material is to be put. Naturally, war business has first call and this business was classified under two heads:—

First, business in which the material enters directly into the production of a munition product, and second, business in which the material is used to produce goods for which the government has immediate use. Illustrative of this second feature would be businesses given over to the production of lacquers used on army uniform buttons or to the production of dyes entering into the manufacture of army cloths. After these two demands are satisfied, other business is considered and amounts of material released in accordance with any surplus existing. In any event, materials commandeered by the government may be disposed of only after the questionnaire which reveals the status of the business—whether it is in one of the two preferred classes or not—has been submitted to Federal authorities and a government order granted.

Such, then, have been the conditions which have been operative during the year 1917. This resume is by no means exhaustive but does outline the main trend of affairs which have affected the drug market and interests and it does in some measure indicate the reasons which brought about the era of high prices, firm markets, shrunken stocks, and quotation-advancing tendencies. No attempt has been made toward extensive price analysis—such studies will be found in their proper places in the detailed market material which follows.

Opium and Its Derivatives.

Gum opium has passed through a year of prices higher than for any period in the history of the trade. 9his applies to all grades of the gum but most especially to Turkish material, the importation of which practically ceased during the year. To supply the needs of manufacturers, the Persian gum was brought in in larger quantities than before. The gum is of lower morphine-content than the Turkish product, but has proven a fitting substitute.

The import figures for gum opium are as follows: 1917, 124,764 pounds, valued at $1,538,803, which compares with the 1916 statistics of 96,608 pounds, valued at $648,063. The increase of value during the year is clearly outlined in these price studies. Prior to the outbreak of the war, opium sold in the New York market at $7.45 per pound during the last week in July.

During the last week in July, and just prior to the outbreak of the world war, gum opium sold in the New York market at $7.45 per pound. In July, 1916, the material advanced to $11.00 per pound, and a year later, in 1917, $30.00 per pound was the universal quotation in the United States. This was the nominal price at the end of the year. The rise in prices stopped only when the Turkish gum became exhausted and Persian products began to arrive.

As the gum came into reserve lower than ever in history of the material, the effect of the shortage became evident as firms, who previously to the hectic times succeeding the war had been manufacturers of the derivatives on a large scale, were forced to abandon production. In an effort to bring relief to the situation, experiments were projected for the growing of the poppy in countries which never before had produced any quantity. Up to the end of the year these efforts were still in the experimental stage.

Morphine followed opium in its upward club to unprecedented levels. When the war broke out, morphine in the New York market was selling at $4.70 per ounce. At the close of the year 1917 the price was $12.80 per ounce.. The demands throughout the year were heavy and, as manufacturers were unable to deliver promptly, second hands secured premium prices for immediately deliverable materials. Russ'a and Japan were two of the largest users of export material. Exports to England and France were heavy and Italian consumption was reported large.

Codeine occupied a high position throughout the year, but a break came in the market with the arrival of heavy English shipments. The tonnage question had entered into the situation as concerns both the transportation of the raw materials to the London markets and the finished product to the United States.

Cocaine at the beginning of the war in 1914 stood at $2.60 per ounce. At the end of 1917 the material was quoted

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on the New York market at $9.00 per ounce. This alone tells the story of the year. It was the same story of restricted production due to lack of raw materials and heavy demands due to the war.

Opium Price Record.

The following table shows the high and low prices for the gum in each of the twelve months of last year:—

Gum.

	Per pound	
	High.	Low.
January	$14.50	$13.50
February	20.00	14.50
March	25.00	20.00
April	28.00	25.00
May	30.00	27.00
June	27.00	27.00
July	30.00	27.00
August	30.00	30.00
September	30.00	30.00
October	30.00	30.00
November	30.00	30.00
December	30.00	30.00
Year	30.00	13.50

Powdered.

	Per pound	
	High.	Low.
January	$15.50	$14.50
February	22.00	15.50
March	26.00	22.00
April	33.00	25.00
May	33.00	28.00
June	29.00	29.00
July	30.00	29.00
August	30.00	30.00
September	30.00	30.00
October	30.00	30.00
November	30.00	30.00
December	32.00	30.00
Year	32.00	14.50

Granular.

	Per pound	
	High.	Low.
January	$15.50	$14.50
February	22.00	15.50
March	26.00	22.00
April	33.00	25.00
May	33.00	28.00
June	31.00	31.00
July	32.00	31.00
August	32.00	32.00
September	32.00	32.00
October	32.00	32.00
November	32.00	32.00
December	32.00	30.00
Year	33.00	14.50

High and Low Prices Since 1870.

We append the following table showing the crops and the high and low prices for cases on spot since 1870:—

Year.	Crop, cases.	Prices High.	Prices Low.
1917	.....	$30.00	$13.50
1916	*.....	13.50	10.75
1915	7,500	11.00	6.90
1914	7,500	10.00	6.00
1913	8,500	8.60	6.00
1912	9,500	8.50	6.00
1911	10,500	8.50	4.70
1910	4,800	6.00	4.80
1909	4,800	6.00	4.00
1908	4,650	5.75	4.05
1907	3,000	7.00	5.45
1906	7,500	3.50	2.72½
1905	3,700	3.30	2.72½
1904	11,200	2.95	2.62½
1903	3,200	3.50	2.70
1902	10,000	3.05	2.70
1901	5,600	3.45	3.00
1900	8,200	3.45	3.00
1899	6,400	3.37½	2.90
1898	3,000	3.75	2.70
1897	7,000	2.85	1.95
1896	3,600	2.40	1.90
1895	7,500	2.30	1.60
1894	4,500	3.25	1.85
1893	2,845	3.15	1.77½
1892	7,500	1.50	1.50
1891	7,400	2.25	1.75
1890	5,300	3.85	2.00
1889	5,500	3.40	2.82½
1888	8,700	3.87½	2.65
1887	7,800	4.60	3.25
1886	7,500	3.25	2.80
1885	7,000	3.90	3.30
1884	5,000	4.10	3.50
1883	6,500	4.12½	3.50
1882	5,500	4.50	3.87½
1881	10,000	6.25	3.90
1880	2,000	7.75	4.87½
1879	4,000	5.25	4.35
1878	5,500	4.70	4.25
1877	9,500	6.70	4.75
1876	3,280	6.60	4.75
1875	6,489	7.75	5.00
1874	2,300	9.00	5.00
1873	3,200	7.90	5.95
1872	4,500	7.90	6.10
1871	7,961	6.00	4.90
1870	4,273	9.40	5.25

*Due to the conditions brought about by the European war, no statistics or even estimates on the 1916 crop of gum opium were available.

Morphine.

The following summary shows the high and low prices of this opium derivative for each month during 1917:—

	Per ounce	
	High.	Low.
January	$7.80	$7.80
February	7.80	7.80
March	9.80	9.80
April	9.80	9.80
May	9.80	9.80
June	9.80	9.80
July	9.80	9.80
August	10.80	9.80
September	11.80	10.80
October	13.80	11.80
November	13.80	12.80
December	12.80	12.80
Year	13.80	7.80

Codeine.

The following table of price fluctuations shows the course of quotations for this opiate each month of last year:—

	Per ounce	
	High.	Low.
January	$9.10	$7.10
February	11.00	9.10
March	11.00	11.00
April	11.00	11.00
May	11.00	11.00
July	11.00	11.00
July	11.00	11.00
August	10.00	10.00
September	10.00	10.00
October	10.00	10.00
November	8.85	8.85
December	8.85	8.85
Year	11.00	7.10

Quinine.

Quinine has been subjected to a severe test during the year. Supplies of cinchona bark, never large since the outbreak of the war, grew less and less until at the end of the year the amount of the raw material reaching the United States from Java had been reduced materially through the restriction of shipping and slow travel. The railroad transportation systems became congested in the course of the year and movements of material from the Pacific coast became markedly slower and unreliable. This situation caused a decided shortage in quinine, for which demands and inquiry increased tremendously with the entrance of the United States into the war. The needs of the Federal purchasing agents may be understood in some degree when it is learned that the original calls for quinine were for amounts far in excess of the total amount of the material throughout the world. The question of the future source of supply of the raw material became acute toward the end of the year.

The British controls gave notice that with the expiration of the trade pact of July 15, 1918, they intend to depend on English planters for their supply of raw material. This left the United States in a position in which its raw material might be subjected to a Dutch-German after-the-war coalition—this coalition is said to be a fact and that the Deutsches Bank, which means the German Government, is back of the combination. The possibility of securing material from other sources of supply through satisfactory agreements became one of the most agitating of subjects to the manufacturers of the material in the United States.

Quinine opened the year a 55c. per ounce, but the price was advanced sharply in February to 75c. per ounce for the bulk sulphate material, with corresponding uplifts for the smaller lots. At this level the manufacturers of the material held the price steady throughout the balance of the year.

High and Low, 30 Years.

The following summary records high and low prices for bulk quinine salts on a basis of sulphate, as maintained by makers during the last thirty years:—

	High.	Low.
1917	75	55
1916	75	50
1915	75	26
1914	31	26
1913	26	19½
1912	19½	14
1911	14	14
1910	14	14
1909	15	14
1908	16	15
1907	22	16
1906	19	14½
1905	23	19
1904	27	21
1903	28	23
1902	28	20
1901	34	27
1900	37	29
1899	40	21
1898	25	18
1897	30	15
1896	27	17½
1895	28	25
1894	27½	25½
1893	25	20
1892	24	20
1891	30	24
1890	37	32
1889	40	32
1888	49	40
1887	61	35
1886	73	49

High and Low, by Months, 1917.

The following table shows the high and low prices for quinine, in bulk, on the basis of sulphate, during the last year:—

	High.	Low.
January	55	55
February	75	55
March	75	75
April	75	75
May	75	75
June	75	75
July	75	75
August	75	75
September	75	75
October	75	75
November	75	75
December	75	75
Year	75	55

Drugs, Pharmaceuticals, Etc.

Changes have been many and frequent during the year. The situation in many lines centered around the question of raw materials and transportation facilities on land and sea. The history of acetanilid has been one of continuously advancing prices. The material opened the year at 48c. per pound, fell away under increased production pressure to 39c. per pound in April. From then until the end of December, the uplift was constant until the closing price—the high price—of the year was 75c. per pound.

Acetphenedin had a price range of $25.00 to $6.50 per pound, which compares with $42.00 to $14.00 in the previous year. Supply and demand were the largest factors in the year's development. The decline to the low figure was not sudden, but began after a rise from the opening price of $22 to $25, which was reached in the last week of March. From this point the decline was steady until the last week in December brought out the price of $6.50 per pound—low for the entire year.

Alcohol was sensationally higher at the end of the year. Export demands were heavy in the early part of the year, but with the entry of the United States into the war the exportation of the material was curtailed and the Government took over control of the entire industry. Exports for the first 11 months in 1916 amounted to 58,036,836 gallons, valued at $18,875,319. In 1917, 18,535,367 gallons, valued at $6,549,422, were exported. All forms rose constantly during the year. Beginning at $2.70 per gallon, ethyl spirits rose gradually until the high mark was touched in October, when $5.60 per gallon was the ruling quotation. Methyl alcohol was scored at 90c. per gallon in January and closed the year at $1.35. Denatured alcohol had a price range from 64c. to 82c. This form weakened a trifle after the high mark was struck in the last week in October.

Soda benzoate fell away steadily during the year. The high figure was the price at which the material opened the year—$8.75 per pound. The downward movement was steady until the bottom—$1.60—was struck in the second week in October. This decline was largely due to increased offerings which manufacturers were able to produce. The recovery was slower than the advance, but by the end of the year the material stood at $2.95 per pound with every indication of further advances. The uplift was due largely to the beginning of a period of restricted production due to the heavy demands for toluol, which the government took over entirely, allotting supplies to manufacturers as surplus developed after government demands were met.

Caffeine Alkaloid.

The law of supply and demand has brought out for this commodity a considerable degree of fluctuation. The breaks were not sharp, but were on the whole the logical price movements resulting from demands made on manufacturers and their ability to fill the requirements. The low figure for the year was $10.50 per pound and this was first reached in January, after the material had opened at $11.25. The first week in February brought out the low price again, but from then until the first week in May the trend was steadily toward $13 per pound—the high figure for the year. Minor fluctuations continued throughout the year and the material closed the period at $12.50.

Quicksilver.

The production of quicksilver was greater during the year of 1917 than it has been since 1883—a period of 34 years. The output for the year was 29,932 flasks of 75 pounds each. In point of value, the production of 1917 had the highest valuation of any year since 1875—a period of 42 years. Export demands have played a heavy part in the price uplifts which were recorded during the year. During the year of 1917 the exports of quicksilver amounted to 11,229 flasks of 75 pounds each, valued $998,470, which compares with 8,880 flasks, value $690,475, for the year 1916. These figures, drawn from Federal sources, indicate that the year just closed was one of the most momentous in the history of the industry. The low figure for the year was reached the first week in the year, when the material was quoted at $80 per flask. Munition manufacturers entered the market as heavy buyers shortly after business had squared away for the year and with demands larger than manufacturers' ability to meet both from war buyers and speculative interests, the price advanced rapidly during the month of February from $86 in the first week of the month to $140 in the third. Prices broke sharply during the next month, the recession stopping at $105 per 75 pound flask. Recovery during that month brought quicksilver to $120 as demands again exceeded the supply available for the moment. A long series of declines followed, with the bottom not reached until the last week in June, when the material stood at $82 per 75 pounds. At the close of the year the material was at premium prices. The manufacturers were asking $115 for such limited amounts as they were able to secure. The second-hand price at this time was in the neighborhood of $125@130 per 75 pound flask.

Castor Oil.

Castor oil received greater attention than ever in the history of the material. The entrance of the United States into the war brought out the necessity for the crushers in this country, and there are practically but three, supplying the government with unheard-of quantities of the oil for use in engines of war, aeroplanes, supply motors, etc. Attacking the problem in a typical American manner, the government proceeded to develop a source from which it could be assured of a sufficient supply of beans. Contracts were let for over 100,000 acres of beans to be grown in this country, Haiti, San Domingo, and Cuba. The seeding for this acreage, which is located in Florida and the Southwest, was obtained from India through especial arrangement with the British government. An association, the American Castor Bean and Oil Association, Inc., was formed at the instance of the government through the War Trade Board and control of the entire industry secured by means of a system of import and export licenses, guarantees by handlers of the material down to five-gallon lots, which are returned to the War Trade Board, and the regulation of lots smaller than five gallons by making group reports on the same. As a result of the huge demands of the government, the crushers toward the end of the year were hardly able to supply their regular buyers with even limited amounts of the material. Second-hands were thus able to enter the market with spot delivery material, and they did so to the extent that material which they purchased at 15 to 16 cents per pound was disposed of at prices varying from 30c. to 40c., with 45c. sales rumored. Great care is being exercised by the government, through the association, to prevent any further lots falling into the speculator's possession. The price curve of the material shows a constant rise from the 18c. price, which ruled in January, to the closing price in December of 26c. per pound. The association at the close of the year was urging earnestly the fixation of price on this commodity by the Federal government.

Glycerine.

Exports of glycerine were curtailed throughout the year. Government figures based on exports from July to December 31 indicate that 9,615,000 pounds left the country, and this amount of the material was valued at $4,747,923. Italy was the recipient of large amounts dating from July 1st. Of the total exportations reported for the period above mentioned, July to the end of November, 7,520,000 pounds were sent to Italy. Imports have fallen off sharply, when the year's receipts are compared with those of the previous year. Importations in 1917 amounted to 2,964,953 pounds, valued at $1,114,312, which compares with 7,026,044 pounds, valued at $2,079,196 in 1916. Large amounts of the crude material have always been brought north from South America, but there have been considerably smaller lots moving from the South American countries during the past year. Spain has been sending her crude supply to Germany via the submarine route. While this statement has not been officially uttered at Washington, the conditions of affairs are well understood by glycerine manufacturers in this country, and the disposition of Spanish crude was vouched for by a prominent refiner.

The Canadian government has contracted for the entire output of the refineries in the Dominion, with the exception of one producer, and his product is merely the subject for further negotiation. Fluctuation has been recorded as supply and demand alternately moved the material upward or sent it to lower levels under depression resulting from the buying-withdrawals by large purchasers. In January the low point of the year was touched at 52c. per pound. October saw the apex of a constantly mounting price curve. The third week of that month brought the price to 70c.—the highest price for the entire year. Buying slackened in November and the price gradually fell off until at the close of the year the material stood at 68c. per pound, with indications rife that further contractions were likely.

Menthol.

Menthol mounted rapidly as Japanese producers went in for the production of garden truck and neglected the mint crop. The price in January was $3.20, and by the fourth week of the month the material was selling at $3.45 per pound. The high for the year was reached in the first week of February when the material sold at $3.50 per pound. Stimulated by the Japanese government, and by the release of large amounts of the material from storage, the commodity began a decline in price which continued until the low point for the year was reached in August, when the commanding figure was $2.85 per pound during the first week. Reports of damage by a typhoon became current somewhat later, and the price began to rise until at the close of the year the material was quoted at $3.15 per pound. These reports seem to have been substantiated to a considerable degree. On the other hand, the low price which Japanese selling controls were willing to give to the mint growers turned the farmer to the more remunerative field of high-priced garden vegetables, etc. This resulted in a partial failure of the Hokkaido crop and resulted in producing a firm primary market toward the end of the year.

Saccharine.

Early in the first quarter of the year, manufacturers of saccharine were reported unable to make quick or even reasonably soon delivery of saccharine. The market rapidly came into the control of the second-hand sellers. From the low price for the year, $16 per pound reached in March, the price

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mounted rapidly to the high level—$43—which was ruling the first week of August. Export demands, especially from Russia, were largely responsible for the high level which the material succeeded in reaching. With the elimination of Russian buying and the establishment of the English industry on a basis large enough to provide for English needs, the fall of price was inevitable with the withdrawal of the heavy export demands.

Miscellaneous.

Codliver oil remained at high levels throughout the year. The Norwegian variety was withdrawn from export at the primary market, and this brought the price on the small lots remaining in the spot market to the high figures of $125@135 per barrel. The quotation at the end of the year became purely nominal. The Newfoundland material was scarce on spot and toward the end of the year sellers reported ideas current in the primary market which would warrant $100 oil in the next year. All varieties included, there were imported into the United States during the year 1917 1,872,304 gallons of oil, valued at $1,832,625, which compares with $1,202,079 gallons, valued at $960,770, the records for 1916. The Norwegian material opened the year at $115, and fell within the month to the low for the year—$112. The price returned upward and the second week of February found a price of $120 per barrel being generally quoted. For the next nine months—until December—the fluctuation was between $115 and $120. In December, the results of the Norwegian export prohibition was felt and the material was advanced to $125, at which point it closed the year.

The Newfoundland oil began the year at $72, and receded to the low level for the year—$66—in the month of April. The withdrawal of Norwegian oil brought out heavy demands, and the price mounted rapidly to $75. With slight fluctuation, the material eventually hit the high for the year in October, when the quotation noted was $77 per barrel. The closing quotation for the year was at $76.

Despite the heavy demand both by the United States government and those of foreign countries, chloroform remained steady in price throughout the year. The price range was from 60c. per pound in January to 63c., the prevailing quotation in December. Socoa butter became in better supply as the year progressed, and with buying not as active as it had been during the previous year, the material sold down over the entire period. Opening the year at 38c., the decline was continuous, with no recoveries registered, to the prevailing price at the end of December of 22c. per pound. Coumarin was in short supply for the entire year. Quoted at $11 per pound at the beginning—and this figure was above the high mark for 1916—the material became subject to a severe drainage, which forced the price upward to $24 per pound in December, and this was the high price for the year. Replacement in adequate amounts was impossible, and hence the high price. Mercurials became very firm, as the price of quicksilver mounted toward the end of the year. Haarlem oil was practically bare on the New York market, and at the close of the year sold at $7 per pound, which compares with the closing price in 1916 of $3.

Sundry Drugs and Miscellaneous Items.

Acetanilid.

The following table gives the high and low prices for acetanilid for each month of 1917:—

	High.	Low.
January	$0.48	$0.42
February	.41	.40
March	.40	.40
April	.40	.39
May	.42	.40
June	.45	.45
July	.50	.49
August	.50	.50
September	.55	.50
October	.65	.60
November	.70	.65
December	.75	.70
Year	.75	.39

Acetphenetidin.

The following table shows the high and low price for acetphenetidin, by months, for 1917:—

	High.	Low.
January	$22.00	$19.00
February	25.00	24.00
March	25.00	24.00
April	25.00	24.00
May	25.00	24.50
June	24.00	23.00
July	22.00	21.00
August	18.00	16.00
September	15.00	11.00
October	10.00	8.00
November	8.50	8.50
December	8.50	6.50
Year	25.00	6.50

Alcohol.

The following summary of prices shows the high and low basic figures of each month of 1917 for ethyl, methyl and denatured alcohol:—

	Ethyl, 188 proof.		Refined methyl, 95%.		Denatured, 180%.	
	H.	L.	H.	L.	H.	L.
January	2.70	2.70	1.00	90	64	64
February	2.70	2.70	1.00	1.00	64	64
March	2.78	2.70	1.05	1.00	00	64
April	3.00	2.80	1.00	1.00	71	69
May	3.04	3.04	1.00	1.00	71	71
June	3.40	3.04	1.00	1.00	1.00	71
July	4.10	3.78	1.00	1.00	1.00	1.00
August	4.30	4.10	1.00	1.00	1.00	1.00
September	4.30	4.30	1.10	1.00	1.00	96
October	5.60	5.60	1.20	1.10	90	82
November	5.60	5.60	1.30	1.10	82	82
December	5.60	5.60	1.35	1.35	82	78
Year	5.60	2.70	1.35	.90	1.00	.64

Benzoate of Soda.

The high and low figures for sodium benzoate for each month of last year are set forth in the following table:—

	Price per lb. High.	Low.
January	8.75	$7.75
February	7.50	7.50
March	7.50	7.25
April	7.25	6.75
May	6.75	5.75
June	5.75	5.50
July	4.50	2.75
August	3.50	2.75
September	2.50	1.70
October	2.00	1.60
November	2.75	2.20
December	2.95	2.75
Year	8.75	1.60

Borax.

In the following table the high and low prices for borax crystals and granulated, in sacks and barrels, are set forth for each month of 1917:—

	Cents per pound—In sacks. High.	Low.	In barrels. High.	Low.
January	7	7	7½	7½
February	7	7	7½	7½
March	7¼	7	7½	7½
April	7¼	7	7½	7½
May	7¼	7	7½	7½
May	7¼	7	7½	7½
July	7¼	7	7½	7½
August	7¼	7	7½	7½
September	7¼	7	7½	7½
October	7¼	7	7½	7½
November	7¾	7¼	7½	7½
December	7¾	7¼	7½	7½
Year	7¾	7	7½	7½

Bromides.

The following table shows the high and low prices for granular bromide of soda, potash and ammonia, by months, for 1917:—

	Bromide ammonium. H.	L.	Bromide potassium. H.	L.	Bromide sodium. H.	L.
January	1.00	1.00	1.35	1.35	72	72
February	1.00	80	1.35	1.00	72	72
March	80	80	1.00	1.00	45	45
April	80	80	1.00	1.00	45	45
May	80	80	1.00	1.00	45	45
June	80	80	1.00	1.00	45	45
July	80	65	1.35	1.00	45	45
August	65	65	1.35	1.35	45	45
September	65	65	1.35	1.35	45	45
October	65	65	1.35	1.35	45	45
November	75	65	1.45	1.35	45	45
December	75	75	1.45	1.45	55	45
Year	1.00	65	1.45	1.00	72	45

Castor Oil.

The following tabulation shows the high and low prices for No. 1 castor oil, in barrels, by months, for last year:—

	High.	Low.
January	18	18
February	19	18
March	20	20
April	22	20
May	24	22
June	24	24
July	24	24
August	24	24
September	24	24
October	24	24
November	24	24
December	26	25
Year	26	18

Caffeine.

The following table of price fluctuations in 1917 shows the high and low figures for caffeine alkaloid in each month throughout the year:—

	Cents per pound. High.	Low.
January	11.25	10.50
February	10.75	10.50
March	11.50	11.00
April	12.50	11.50
May	13.00	12.50
June	13.00	12.50
July	12.00	11.50
August	11.25	11.00
September	11.00	11.00
October	11.00	11.00
November	11.50	11.00
December	12.50	11.50
Year	13.00	10.50

Cocoa Butter.

In the following table the high and low prices for cocoa butter are given for each month of 1917:—

	Cents per pounds—Bulk. High.	Low.	Wrapped fingers in 12-lb. boxes. High.	Low.
January	38	32	42	40
February	33	32	42	40
March	33	32½	42	40
April	32½	31	40	40
May	31	31	40	40
June	31	26½	39	34
July	26	26	34	34
August	26	26	34	34
September	26	26	34	33
October	26	26	33	33
November	26	26	33	30
December	26	22	30	30
Year	38	22	42	30

Chloroform.

The following table shows the high and low price for chloroform, by months, during 1917:—

	High.	Low.
January	60	60
February	60	60
March	60	60
April	60	60
May	60	60
June	60	60
July	60	60
August	60	60
September	60	60
October	63	63
November	70	63
December	63	62
Year	70	60

Codliver Oil.

As a basis for comparison with the result of the ten previous years we append the following table, showing the production of Lofoten and total Norway oil, the total catch of fish in millions and the ruling basis for shipments of medicinal oil at the close of the season:—

	Lofoten, final hecto-liters.	Norway, final hecto-liters.	Fish. millions, total.	Quotations. f. o. b. Norway.
1916	15,938	60,068	80	$85.00@160.00
1915	10,905	52,918	66½	20.50@ 82.50
1914	9,619	57,200	81½	17.50@—
1913	6,000	48,300	76	24.00@—
1912	12,000	76,200	99	14.00@—
1911	7,900	43,300	64½	26.00@—
1910	13,500	41,000	55½	25.00@—
1909	20,000	50,400	56½	15.00@—
1908	20,100	59,100	48½	13.50@—
1907	20,400	46,400	47½	17.50@—
1906	17,000	42,000	46½	16.00@—
1905	11,500	41,900	45	16.00@—
1904	3,300	17,500	50	40.00@—
1903	000	2,800	48	120.00@—

We also append the following summary of high and low quotations for Norwegian during the last three years:—

	1915 H.	L.	1916 H.	L.	1917 H.	L.
Jan.	21.50	20.50	95.00	78.00	115.00	112.00
Feb.	24.00	21.50	95.00	88.00	120.00	115.00
Mar.	40.00	24.00	125.00	90.00	120.00	115.00
Apr.	39.00	37.00	150.00	120.00	125.00	120.00
May.	42.00	35.00	150.00	150.00	120.00	120.00
June.	45.00	40.00	150.00	140.00	120.00	120.00
July.	75.00	45.00	140.00	140.00	120.00	120.00
Aug.	80.00	70.00	140.00	140.00	120.00	120.00
Sept.	82.50	80.00	138.00	138.00	120.00	115.00
Oct.	82.50	80.00	135.00	135.00	120.00	120.00
Nov.	80.00	77.50	130.00	120.00	120.00	115.00
Dec.	80.00	76.00	130.00	115.00	125.00	125.00
Year.	82.50	20.50	150.00	78.00	125.00	112.00

A record of the high and low prices asked for Newfoundland codliver oil in the New York market in 1917 follows:—

	High.	Low.
January	$72.00	$70.00
February	70.00	70.00
March	68.00	68.00
April	75.00	66.00
May	75.00	75.00
June	75.00	75.00
July	75.00	75.00
August	75.00	75.00
September	75.00	70.00
October	77.00	72.00
November	77.00	75.00
December	76.00	76.00
Year	77.00	66.00

Corn Syrup and Corn Sugar.

The high and low figures for corn syrup and corn sugar in each month of last year are set forth in the following table:—

	Per 100 pounds—Corn syrup. 42 degrees. High.	Low.	Corn sugar, "pure food." High.	Low.
January	$3.24	$3.21	$3.24	$3.21
February	3.34	3.24	3.34	3.24
March	3.44	3.34	3.44	3.34
April	4.74	3.64	4.81	3.71
May	5.14	4.84	5.21	4.91
June	5.14	5.14	5.21	5.21
July	5.89	5.14	5.91	5.21
August	6.39	6.14	6.42	6.16
September	5.89	5.64	5.91	5.70
October	5.64	5.64	5.70	5.70
November	5.64	5.64	5.70	5.70
December	5.64	5.64	5.70	5.70
Year	6.39	3.21	6.42	3.21

Coumarin.

The following table shows the high and low figures reached by coumarin each month in 1917:—

	Per pound—High.	Low.
January	$11.50	$11.00
February	12.00	11.50
March	15.00	13.00
April	18.00	16.00
May	20.00	18.00
June	20.00	19.00
July	20.00	18.00
August	18.00	18.00
September	18.00	18.00
October	20.00	18.00
November	22.00	20.00
December	24.00	22.00
Year	24.00	11.00

Epsom Salt, U. S. P.

The following table shows the high and low price for epsom salt, U. S. P., per 100 pounds, by months, for 1917:—

	High.	Low.
January	$2.25	$2.00
February	2.75	2.50
March	3.75	3.00
April	4.25	4.00
May	4.37½	4.25
June	4.25	4.00
July	4.12½	4.00
August	4.00	3.90
September	4.10	3.75
October	3.62½	3.62½
November	3.62½	3.62½
December	4.37½	2.00

Ergot.

In the appended table there will be found the high and low prices reached by Russian and Spanish ergot each month in 1917:—

	Cents per pound—Russian. High.	Low.	Spanish. High.	Low.
January	68	68	68	68
February	70	68	70	68
March	72	68	72	68
April	72	70	72	72
May	75	70	72	72
June	75	75	72	72
July	75	75	73	72
August	75	75	73	73
September	75	75	73	72
October	75	73	72	70
November	75	73	75	70
December	78	75	78	75
Year	78	68	78	68

Fusel Oil.

In the subjoined table will be found the high and low figures reached for crude and refined fusel oil in each month of the last year:—

	Domestic—Crude, per pound, High.	Low.	Refined, per pound. High.	Low.
January	$3.50	$3.50	$4.00	$3.85
February	3.75	3.50	4.25	4.00
March	3.75	3.75	4.25	4.00
April	3.75	3.45	4.00	3.60
May	3.50	3.45	4.35	3.60
June	3.50	3.50	4.35	4.35
July	3.50	3.50	4.35	4.35
August	4.25	3.50	5.25	4.35
September	4.50	4.25	5.25	5.25
October	4.50	4.50	5.25	5.25
November	4.50	4.50	5.25	5.25
December	4.50	4.50	5.25	5.25
Year	4.50	3.45	5.25	3.60

Glycerine.

The following summary shows the prevailing range of high and low quotations for C. P. glycerine during 1917:—

GLYCERINE, C. P.	Cents per lb. High.	Low.
January	55	52
February	55	55
March	55	55
April	56	55
May	60	56
June	61	61
July	64	62
August	64	64
September	68	64
October	70	68
November	70	70
December	70	68
Year	70	52

A record of the highest and lowest figures for the four previous years follows:—

	High.	Low.		High.	Low.
1915	65	19¼	1913	21	18¾
1914	27	19¾	1912	20	16

Haarlem Oil.

The following table of price fluctuations in 1917 shows the high and low figures for each month throughout the year:—

	Per gross bottles—High.	Low.
January	$3.40	$3.00
February	5.00	3.75
March	5.50	5.00
April	6.00	5.50
May	6.00	6.00
June	6.00	6.00
July	6.00	6.00
August	6.50	6.50
September	6.50	6.50
October	6.50	6.50
November	7.00	7.00
December	7.00	7.00
Year	7.00	3.00

Hypophosphites.

In the following table the high and low prices for hypophosphites of lime, potash and soda are set forth for each month of 1917:—

	Cents per pound—Lime. H.	L.	Potash. H.	L.	Soda. H.	L.
January	77	77	1.50	1.50	82	82
February	77	77	1.50	1.50	82	82
March	77	77	1.50	1.50	82	82
April	87	77	1.65	1.52	92	82
May	87	87	1.65	1.65	92	92
June	87	87	1.65	1.65	92	92
July	87	87	1.65	1.65	92	92
August	1.00	87	2.15	1.65	1.10	92
September	1.00	1.00	2.15	2.15	1.10	1.10
October	1.00	1.00	2.15	2.15	1.10	1.10
November	1.00	1.00	2.15	2.15	1.10	1.10
December	1.00	1.00	2.15	2.15	1.10	1.10
Year	1.00	77	2.15	1.50	1.10	82

Lycopodium.

In the following table the high and low prices for lycopodium are given for each month of 1917:—

	Per pound—High.	Low.
January	$1.20	$1.15
February	1.20	1.20
March	1.20	1.20
April	1.20	1.20
May	1.40	1.20
June	1.50	1.45
July	1.60	1.50
August	1.80	1.60
September	2.40	2.20
October	2.40	2.00
November	2.00	2.00
December	2.00	1.85
Year	2.40	1.15

Manna.

The following table shows the high and low figures reached for large and small flake manna in each month of 1917:—

	Per pound—Large. High.	Low.	Small. High.	Low.
January	$1.65	$1.00	$0.90	$0.75
February	1.00	1.00	.80	.75
March	1.10	1.00	.80	.75
April	1.00	1.00	.75	.75
May	1.00	1.00	.75	.75
June	1.00	.95	.75	.72
July	.95	.95	.72	.72
August	.95	.95	.72	.72
September	.95	.95	.72	.70
October	.95	.95	.70	.70
November	.95	.95	.73	.70
December	.95	.95	.73	.73
Year	1.65	.95	.90	.70

Menthol.

The following summary shows the high and low prices for each month during the last year:—

	Per pound—High.	Low.
January	$3.45	$6.20
February	3.50	3.45
March	3.40	3.35
April	3.30	3.15
May	3.15	3.00
June	3.15	3.15
July	3.10	2.90
August	3.00	2.85
September	3.10	3.00
October	3.20	3.05
November	3.20	3.17
December	3.17	3.15
Year	3.50	2.85

High and low quotations for the years 1895 to 1917 follow:—

	High.	Low.		High.	Low.
1895	$4.75	$4.00	1907	$2.60	$1.90
1896	4.75	2.50	1908	2.15	1.85
1897	4.20	1.85	1909	2.75	2.05
1898	2.60	2.00	1910	3.45	2.60
1899	3.00	1.20	1911	7.00	3.45
1900	3.90	2.35	1912	14.00	6.00
1901	4.75	3.50	1913	10.25	2.70
1902	7.00	3.80	1916	3.40	2.75
1903	8.00	5.25	1914	4.75	2.35
1904	6.25	2.50	1915	3.50	2.50
1905	3.00	1.75	1917	3.50	2.85
1906	2.90	2.15			

Mercurials.

Hard.

In the appended table there will be found the high and low prices for 50-pound lots reached each month in 1917 by the hard mercurials—calomel, bisulphate of mercury and red and white precipitates:—

Calomel.

(American.)

	High.	Low.
January	$1.43	$1.43
February	1.67	1.43
March	1.79	1.67
April	1.91	1.79
May	1.91	1.91
June	1.91	1.91
July	1.91	1.91
August	1.91	1.91
September	1.91	1.91
October	1.91	1.91
November	1.91	1.91
December	1.91	1.91
Year	1.91	1.43

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	Mercury bisulphate.		Precipitates Red.		White.	
	High.	Low.	High.	Low.	High.	Low.
January	$1.07	$1.07	$1.57	$1.57	$1.67	$1.67
February	1.30	1.07	1.84	1.57	1.94	1.67
March	1.40	1.30	1.97	1.84	2.06	1.94
April	1.50	1.40	2.10	1.97	2.20	2.06
May	1.50	1.50	2.10	2.10	2.20	2.20
June	1.50	1.50	2.10	2.10	2.20	2.20
July	1.50	1.50	2.10	2.10	2.20	2.20
August	1.50	1.50	2.10	2.10	2.20	2.20
Sept.	1.50	1.50	2.10	2.10	2.20	2.20
October	1.50	1.50	2.10	2.10	2.20	2.20
Nov.	1.50	1.50	2.10	2.10	2.20	2.20
Dec.	1.50	1.50	2.10	2.10	2.20	2.20
Year	1.50	1.07	2.10	1.57	2.20	1.67

Soft.

In the subjoined table will be found the high and low figures reached by the soft mercurials — blue mass and mercurial ointments — in each month of the last year:—

	Per pound— Blue mass.		Mercurial ointment. 33%		50%	
	High.	Low.	High.	Low.	High.	Low.
January	$0.60	$0.60	$0.63	$0.63	$0.86	$0.86
February	.68	.60	.71	.63	.99	.86
March	.73	.68	.76	.71	1.06	.99
April	.78	.73	.81	.76	1.13	1.06
May	.78	.78	.81	.81	1.13	1.13
June	.78	.78	.81	.81	1.13	1.13
July	.78	.78	.81	.81	1.13	1.13
August	.78	.78	.81	.81	1.13	1.13
September	.83	.83	.86	.86	1.18	1.18
October	.83	.83	.86	.86	1.18	1.18
November	.83	.83	.86	.86	1.18	1.18
December	.83	.83	.86	.86	1.18	1.18
Year	.83	.60	.86	.63	1.18	.86

Naphthaline.

The following table shows the high and low price of pure white naphthaline flakes, by months, during 1917:—

	Cts. per gal. High.	Low.
January	9½	9
February	9	9
March	10	9½
April	9½	9½
May	10	9½
June	9½	9½
July	9½	9
August	9	9
September	9¼	9
October	10	9¼
November	10	9¼
December	11½	10
Year	11½	9

Nux Vomica.

In the appended table there will be found the high and low prices for whole nux vomica reached each month in 1917:—

	Cts. per lb. High.	Low.
January	7½	6½
February	12	8
March	13	12
April	13	12½
May	13	12½
June	13½	12
July	12	11½
August	12	12
September	12	12
October	12	12
November	12½	12½
December	12½	12½
Year	13½	6½

Paraffine.

The following table shows the high and low price of refined domestic paraffine wax, 118 to 120 degrees melting point, by months, for 1917:—

	High.	Low.
January	6½	5½
February	6½	6½
March	6½	6½
April	6¾	6½
May	7½	7
June	7¼	7¼
July	7¼	7¼
August	7½	7¼
September	7¾	7½
October	8	7¾
November	10¾	10½
December	10¾	10¾
Year	10¾	5½

Permanganate of Potash.

In the subjoined table will be found the high and low figures reached by potassium permanganate in each month of the last year:—

	High.	Low.
January	$4.00	$2.25
February	4.00	3.75
March	3.50	3.50
April	4.00	3.50
May	4.00	4.00
June	4.00	4.00
July	4.10	4.00
August	4.00	4.00
September	4.00	4.00
October	4.00	3.75
November	4.00	4.00
December	4.00	4.00
Year	4.10	2.25

Quicksilver.

The high and low figures for quicksilver in flask and jobbing lots in each month of last year are set forth in the following table:—

	Per flask of 75 pounds. High.	Low.	Per pound. High.	Low.
January	$ 86.00	$ 86.00	$1.05	$1.05
February	140.00	86.00	2.00	1.25
March	120.00	105.00	1.75	1.50
April	120.00	113.00	1.75	1.75
May	113.00	100.00	1.75	1.50
June	95.00	82.00	1.50	1.50
July	115.00	90.00	1.75	1.50
August	115.00	115.00	1.75	1.75
September	115.00	108.00	1.75	1.74
October	100.00	100.00	1.74	1.60
November	105.00	100.00	1.75	1.60
December	115.00	115.00	1.82½	1.82½
Year	140.00	86.00	1.82½	1.05

Rochelle Salts and Seidlitz Mixture.

The following table shows the high and low figures reached by the rochelle salts and seidlitz mixture in each month of 1917:—

	Cents per pound— Rochelle salts. High.	Low.	Seidlitz mixture. High.	Low.
January	33½	33½	26	26
February	36½	33½	28	26
March	36½	36½	28	28
April	37½	36½	29	28
May	37½	37½	29	29
June	39	39	30	30
July	39	39	30	30
August	39	39	30	30
September	39	39	30	30
October	39	39	30	30
November	39	39	30	30
December	39	39	30	30
Year	39	33½	30	26

Saccharine.

In the following table the high and low prices of saccharine are set forth for each month of 1917:—

	Per pound— High.	Low.
January	$20.50	$18.00
February	18.00	18.00
March	18.50	16.00
April	23.00	18.00
May	33.00	25.00
June	35.00	32.00
July	40.00	36.00
August	42.00	39.00
September	41.00	38.00
October	42.00	41.00
November	41.00	41.00
December	41.00	41.00
Year	42.00	16.00

Salol.

In the following table the high and low prices for salol, in bulk, are given for each month of 1917:—

	Per pound. Manufacturers'. High.	Low.
January	$2.50	$2.00
February	2.00	1.40
March	1.40	1.40
April	1.50	1.40
May	1.50	1.50
June	1.50	1.50
July	1.50	1.50
August	1.50	1.50
September	1.50	1.50
October	1.50	1.50
November	1.60	1.50
December	1.65	1.65
Year	2.50	1.40

Santonine.

The following table of price fluctuations in 19175 shows the high and low figures for santonine crystals, in bulk, in each month throughout the year:—

	Per pound— High.	Low.
January	$36.00	$36.00
February	36.00	36.00
March	36.00	36.00
April	36.00	36.00
May	36.00	36.00
June	36.00	36.00
July	36.00	36.00
August	36.00	36.00
September	36.00	36.00
October	36.00	36.00
November	36.50	36.00
December	36.50	36.50
Year	36.50	36.00

Strychnine.

The following table shows the high and low figures for strychnine sulphate in each month of 1917:—

CRYSTALS, BULK.

	Cents per ounce— High.	Low.
January	1.10	1.10
February	1.10	1.10
March	1.10	1.10
April	1.10	1.10
May	1.10	1.10
June	1.10	1.10
July	1.10	1.10
August	1.10	1.10
September	1.10	1.10
October	1.10	1.10
November	1.10	1.10
December	1.10	1.10
Year	1.10	1.10

Sugar of Milk.

In the appended table there will be found the high and low prices for powdered sugar of milk reached each month in 1917:—

	Cents per pound— High.	Low.
January	32	32
February	35	32
March	35	33
April	36	36
May	37	36
June	38	38
July	40	39
August	42	40
September	42	42
October	42	42
November	48	43
December	48	46
Year	48	32

Tartar Emetic.

In the subjoined table will be found the high and low figures for the technical grade in casks reached in each month of the last year:—

	Cents per pound— High.	Low.
January	61	61
February	61	61
March	61	61
April	61	61
May	62	61
June	62	62
July	62	62
August	62	62
September	62	62
October	62	62
November	67	62
December	67	67
Year	67	61

Thymol.

The high and low figures for thymol in each month of last year are set forth in the following table:—

	Per pound— High.	Low.
January	$11.50	$10.50
February	12.50	11.75
March	14.00	13.00
April	17.00	16.00
May	17.50	16.50
June	17.50	17.00
July	8.25	17.25
August	17.25	17.00
September	17.25	17.00
October	17.25	16.00
November	17.50	17.50
December	17.50	17.00
Year	18.25	10.50

Acids.

The entire list of acids has been sustained at high levels throughout the year, and the high prices were in a large measure due to the high costs of raw materials. Transportation costs have mounted and labor at the source of raw material supply was never higher. These elements are operating to secure for the entire list a firm position. Some few comparisons of prewar prices with those ruling at the close of 1917 may prove of interest. Acetic acid per 100 pounds was quoted in July, 1914, at $1.50, while in December, 1917, the price was $5.50 per 100 pounds. Benzoic acid stood at 85c. per pound in 1914, and in 1917 the price was $11 per pound. Carbolic acid sold previous to the war at 7¾c. per pound. The quotation in December, 1917, was 53c. per pound. Other examples might be selected with ease, but they would only tell the story which is clearly outlined in thees quoted at random.

Citric.

Below are set forth the high and low prices for citric acid in each month of 1917:—

	For crystals, in barrels. High.	Low.
January	$0.65	$0.65
February	.72	.68
March	.72	.72
April	.72	.72
May	.72	.72
June	.72	.72
July	.72	.72
August	.72	.72
September	.72	.72
October	.72	.72
November	.72	.72
December	.75	.75
Year	.75	.65

Carbolic.

The following table shows the high and low figures reached by U. S. P. phenol in each month of 1917:—

	Per pound— In drums. High.	Low.	In 1-lb. bottles. High.	Low.
January	$0.53	$0.50	$0.60	$0.60
February	.52	.48	.60	.58
March	.47	.43	.58	.53
April	.43	.42	.53	.53
May	.42	.42	.53	.53
June	.43	.41	.53	.53
July	.41	.40	.50	.50
August	.40	.40	.50	.50
September	.43	.40	.50	.50
October	.48	.43	.55	.50
November	.53	.51½	.60	.55
December	.53	.53	.60	.60
Year	.53	.40	.60	.50

Picric.

In the following table the high and low prices for picric acid are set forth for each month of 1917:—

	Per pound— High.	Low.
January	$0.75	$0.75
February	.75	.70
March	.80	.75
April	.75	.70
May	.80	.80
June	.80	.75
July	.95	.75
August	.80	.75
September	.75	.75
October	.85	.75
November	.85	.85
December	.85	.85
Year	.95	.70

Salicylic.

The following table of price fluctuations in 1917 shows the high and low figures for salicylic acid in each month throughout the year:—

	Per pound— High.	Low.
January	$1.00	$1.00
February	1.00	.80
March	.80	.75
April	.80	.80
May	.80	.80
June	.85	.85
July	.85	.85
August	.85	.85
September	.85	.85
October	1.35	.85
November	1.35	.80
December	.90	.90
Year	1.35	.75

Tannic.

In the following table the high and low prices for tannic acid are set forth for each month of 1917:—

	Per pound— U. S. P. bulk. High.	Low.
January	$1.00	$0.95
February	.95	.95
March	.95	.95
April	.95	.95
May	1.15	1.15
June	1.25	1.15
July	1.30	1.25
August	1.30	1.30
September	1.30	1.30
October	1.30	1.30
November	1.30	1.30
December	1.30	1.30
Year	1.30	.95

Balsams.

Balsam copa'ba was materially higher throughout the year as compared with its positions during the period of 1916. The principal reasons for this condition was the shortage in supplies brought out by the difficulties of shipping and conditions obtaining at the primary market. South American material opened the year at 65c. per pound —the low figure of the year. Gradually advancing under the dual influence of depleted stocks and light arrivals of replacement stocks, the commodity recorded 95c. per pound in August. Supply and demand brought out considerable fluctuation between this high figure for the year and 92½c. per pound, but at the close of the year, the material stood at its high mark—95c. per pound.

Para balsam has a history of continuous advance throughout the year. It was noted at 48c. per pound at the beginning of the year, and as buying increased and stocks were not replaced in ratio, advancements took place until in August the high price of the year was recorded at 65c. per pound. This price ruled at the close of the year. Both Canadian and Oregonian fir balsam held fairly steady during the year. Canadian material opened at $5.50 per gallon—the low figure for the year—and in May the high was reached at $6. This price ruled until the third week in September, at which time a decline to $5.90 was registered which price was next week supplanted by $5.75 per gallon. At this position the material held firm and closed the year without further fluctuation.

Balsam Peru was rather featureless during the year. The law of supply and demand brought out a fluctuation covering a range of $1 per pound. The material opened the year at $3.35 and declined under pressure to $3.25 per pound in the first week of March. The recovery set in immediately and a gradual advance took place until $4.25 per pound was the commanding price in August. This was the ruling quotation until December 1, when buying became less active and a decline was noted to $4. The material clased the year at $3.75 per pound. Balsom tolu has a history of steady advances covering the January price at 35c. per pound to the December year—closing figure of $1 per pound. The advance was due to the steady lowering of available stocks by active buying.

Copaiba.

The following table shows the range of quotations for natural South American and Para balsam copaiba for each month in 1917:—

	Genuine— South American. High.	Low.	Para. High.	Low.
January	$0.70	$0.65	$0.50	$0.48
February	.75	70	.50	.50
March	.75	.70	.50	.50
April	.75	.75	.52½	.50
May	.85	.75	.55	.52½
June	.95	.90	.60	.60
July	.90	.90	.63	.58
August	.95	.90	.68	.65
September	.92½	.92½	.65	.65
October	.95	.92½	.65	.65
November	.95	.92½	.65	.65
December	.95	.95	.65	.65
Year	.95	.65	.68	.48

Fir Balsam.

In the following table the high and low prices for Canada and Oregon fir balsam are given for each month of 1917:—

	Per gallon— Canada. High.	Low.	Oregon. High.	Low.
January	$5.50	$5.50	$0.85	$0.80
February	5.50	5.50	.85	.85
March	5.50	5.50	.95	.90
April	5.50	5.50	1.00	.95
May	6.00	5.50	1.00	.95
June	6.00	6.00	.95	.90
July	6.00	6.00	.90	.90
August	6.00	6.00	.90	.90
September	6.00	5.75	.90	.90
October	5.75	5.75	.95	.90
November	5.75	5.75	1.15	1.10
December	5.75	5.75	1.15	1.15
Year	6.00	5.50	1.15	.80

Balsam Peru.

Below are set forth the high and low prices for balsam Peru in each month of 1917:—

	Per pound— High.	Low.
January	$3.35	$3.35
February	3.35	3.30
March	3.30	3.25
April	3.75	3.50
May	4.00	4.00
June	4.00	4.00
July	4.15	4.10
August	4.25	4.25
September	4.25	4.25
October	4.25	4.25
November	4.25	4.25
December	4.00	3.75
Year	4.25	3.25

Balsam Tolu.

Below are set forth the high and low prices for balsam tolu in each month of 1917:—

	Per pound— High.	Low.
January	$0.35	$0.35
February	.35	.35
March	.37	.36
April	.37	.37
May	.40	.38
June	.40	.40
July	.40	.40
August	.40	.40
September	.40	.40
October	.45	.40
November	.52½	.48
December	1.00	.60
Year	1.00	.35

Barks.

As with the other botanicals, so with barks. The year has been one of consistently high levels sustained with very few reactions. Conditions at crop gathering centers has militated against the marketing of even average sized crops. Transportation toward the end of the year prevented movements of material in quantities large enough to replace stocks adequately in the marketing centers. Cascara sagrada was active through the entire period. Beginning at 8¾c. per pound—one-quarter o fa cent above the closing price for 1916—the material was forced higher and higher by the drainage to which stocks were subjected. The high for the year was reached in December, when the material stood at 14c. per pound. In the second week of the month, large interests offered several carloads at 12½c. per pound at which level the material was found at the close of the year. Condurango bark was inactive throughout the year, being noted steady throughout the period, with only minor fluctuations recorded. It began the year at 13c. per pound and closed at 12½c., the high mark being reached in the fourth week in September, at 14c. per pound.

Cottonroot bark was quiet, opening the year at 8c. per pound and ending the year at 10c. per pound, the high for the year. Elm bark experienced little fluctuation ,being noted at 16c. in January and at 17c. in December closing. The high was 18c., reached in the last week of August. Lemon peel bark was a constant gainer in strength, being noted at 5c. as the opening price of the year, after which it rose to 8c. per pound in May, followed by a 9c. price, which became operative in the last week of September, and at which price the material closed the year. Prickly ash bark varied but slightly, the opening figure

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being 11c. per pound and the closing price 12c. Soap bark remained at practically the figures at which it closed the year in 1916.

Wahoo bark of root closed a year of higher levels, as compared with 1916, at 45c. per pound, the high of the year, and a price reached in October. The advance throughout the year was over a range of 15c. per pound, the opening price being 30c. per pound, the closing figure in 1916. The bark of tree was colorless throughout the year, remaining at 14c. per pound for the entire period.

Condurango.

Below are set forth the high and low prices for condurango bark in each month of 1917:—

	Cents per pound—High.	Low.
January	13	13
February	13	13
March	13	12
April	12	12
May	13	12
June	13	13
July	13	12
August	12	12
September	14	13
October	14	14
November	14	14
December	13	12
Year	14	12

Cascara Sagrada.

The following table shows the highest and lowest prices by months during the last year, based on the figures for new bark, older goods usually bringing a premium of 1@3c.:—

	Cents per pound—High.	Low
January	11	8¾
February	11½	11
March	11½	11½
April	12	11½
May	12	12
June	12½	12½
July	12½	12½
August	12½	12½
September	12½	12½
October	13	12½
November	13	13
December	14	12½
Year	14	8¾

Cottonroot.

Below are set forth the high and low prices for cottonroot bark in each month of 1917:—

	Cents per pound—High.	Low.
January	8	8
February	8	8
March	8	8
April	8	8
May	8	8
June	8	8
July	8	8
August	8	8
September	8	8
October	8	7
November	8	7
December	10	8
Year	10	7

Elm.

The following table shows the high and low prices for each month of 1917 for elm bark:—

	Cents per pound—High.	Low.
January	16	16
February	16	16
March	16	16
April	18	16
May	18	17
June	17	16
July	16	16
August	18	16
September	18	18
October	18	18
November	17	17
December	17	17
Year	18	16

Lemon Peel.

Below are set forth the high and low prices for lemon peel in each month of 1917:—

	Cents per pound—High.	Low.
January	5	5
February	5	5
March	5	5
April	5	5
May	8	5
June	8	8
July	8	8
August	8	8
September	9	8
October	9	9
November	9	9
December	9	9
Year	9	5

Prickly Ash.

In the following table the high and low prices for prickly ash bark are given for each month of 1917:—

	Northern & Southern. Cents per pound—High.	Low.
January	11	11
February	11	11
March	11	11
April	11	11
May	11	11
June	11	11
July	11	11
August	11	11
September	11	11
October	11	11
November	12	11
December	12	12
Year	12	11

Soap.

Below are set forth the high and low prices for soap bark in each month of 1917:—

	Whole. H.	L.	Cut. H.	L.	Crushed. H.	L.
January	8	8	15	15	9½	9½
February	8	8	15	15	9½	9½
March	8	7½	15	15	10	9½
April	7½	7	15	15	10	9½
May	7½	7½	15	15	9½	9½
June	8½	7½	15	15	10	9½
July	8½	8½	15	15	10	10
August	8½	8½	15	15	10	10
September	9	8½	15	15	10	10
October	9	9	15	15	10	10
November	9	9	15	15	10	10
December	9	9	15	15	10	10
Year	9	7½	15	15	10	9½

Wahoo.

The following table shows the high and low prices for each month of 1917 for wahoo bark of root and tree:—

	Per pound—Bark of root. High.	Low.	Bark of tree. High.	Low.
January	30	30	14	14
February	30	30	14	14
March	30	30	14	14
April	30	30	14	14
May	30	30	14	14
June	35	30	14	14
July	35	35	14	14
August	35	35	14	14
September	40	35	14	14
October	45	45	14	14
November	45	45	14	14
December	45	45	14	14
Year	45	30	14	14

Berries.

All items in the berry list have maintained the positions which they attained at the close of 1916 and in some cases, cases where trade demands operated with the high cost of importation and the restricted amounts of material which entered the country, the commodities have registered further advances, some of which may be termed sharp and vigorous uplifts. Cubeb berries were in constant demand throughout the period and prices advanced substantially over the closing quotations of 1916. The ordinary berries began the year at 42½c. per pound—the low figure for the year—and the conditions outlined above gradually forced advances until at the close of year the material was quoted at 95c. per pound—the high mark for the year and one which was reached in August. Berries of the XX variety duplicated this process of advance to the extent that beginning with the opening price of 47½c. per pound, the advance was continuous until 1 per pound was recorded in August. From then until the end of the year the price remained at this highest price for the year. The powdered variety covered the range of price movement—45c. to $1—under conditions similar in every way to the other berries. Juniper berries were steady over the year at prices ranging from 5c. to 7c. per pound. Prickly ash berries were non-fluctuand to any degree, opening the year at 12c. per pound and closing it at 11c.

Cubebs.

The following table shows the high and low prices in each month of 1917 for cubeb berries:—

	Cents per pound—Ordinary. H.	L.	XX. H.	L.	Powdered. H.	L.
January	65	42½	60	47½	60	45
February	65	55	70	60	70	60
March	70	65	75	70	75	70
April	70	70	75	75	75	75
May	70	70	75	75	75	75
June	70	70	75	75	75	75
July	80	75	85	80	75	75
August	95	85	1.00	90	85	80
September	95	95	1.00	1.00	1.00	1.00
October	95	95	1.00	1.00	1.00	1.00
November	95	95	1.00	1.00	1.00	1.00
December	95	95	1.00	1.00	1.00	1.00
Year	95	42½	1.00	47½	1.00	45

Juniper.

Below are set forth the high and low prices for juniper berries in each month of 1917:—

	Cents per pound—High.	Low.
January	5½	5
February	7	5½
March	7	6½
April	6¾	6½
May	6¾	6¾
June	6¾	6¾
July	7	6¾
August	7	7
September	7	7
October	7	6½
November	6½	6½
December	6½	6½
Year	7	5

Prickly Ash.

In the following table the high and low prices for prickly ash berries are given for each month of 1917:—

	Per pound—High.	Low.
January	$0.12	$0.12
February	.12	.12
March	.12	.12
April	.12	.12
May	.12	.12
June	.12	.12
July	.12	.12
August	.12	.12
September	.12	.12
October	.12	.11
November	.11	.11
December	.11	.11
Year	.12	.11

Beans.

The vanilla bean market has felt throughout the year the effect of the short crop which was marketed last year. While the price variation has not been great, the tone of the market has been firm for the entire period. By December there were only small and scattered lots of Mexican beans to be had, and some sellers were receiving as high as $6 per pound for the material. The outlook for the new crop was poor at the close of the year. A rebel movement against Papantula served to jeopardize not only the gathering and curing of the crop, but also brought about apprehension on the part of large buyers to the extent that they were reluctant to send gold and silver into the country. All the business at Papantula is done on a cash basis, and cash means either gold or silver. The net result of this was to delay the crop to the extent that it was freely predicted no new-crop Mexican vanilla would reach New York until midsummer. The crop last year was estimated to have been short of 200,000 pounds, and estimates made by prominent Mexican and American interests in Papantula place the new crop at not more than 100,000 pounds of whole beans. The cuts are estimated at 35,000 pounds. This shortage has caused buyers to turn to Bourbon and Tahiti beans to not only tide over the period in which there is more or less certain to be little or no Mexican vanilla, but also to supplant the shortage in the Mexican beans. The Bourbon bean has been firm throughout the year. Difficulties in shipping at source have made it hard to market a crop comparable with the best the islands have produced. Up to the end of January no new crop vanilla had reached the Marseilles market. Reports from the Marseilles market indicated at the end of the year that the material was firmly held in French hands, the price ruling being from 17 to 18 francs per kilo. Higher prices were predicted for the coming year. Tahiti beans were firm all year. Mexican whole beans opened the year at $4.75 per pound. This price ruled until April, when the assured short crop raised the price to $5. This figure obtained until November, when offerings were placed on the market at $4.50 per pound, only to be abandoned for the $5 figure in the third week of the month. The second week of December found the material offered at $4.75 per pound, which was the closing quotation for the year. Bourbon beans started the year at $2.50, gradually declined until in July the ruling price was $2@2.15 per pound. Strength was gradually regained until in October $2.50 was the ruling quotation. In November the material dropped to $2 per pound and this was the closing quotation for the year. Tahiti beans fluctuated between $1.55, which was the ruling quotation at the beginning of the year, and $1.42½, the closing price for the year. Tonka beans were rather featureless throughout the year, the price not varying greatly from the 1916 quotations; 85c. per pound was the ruling quotation for most of the year, with 90c. ruling for the last two and a half months of the year. Calabar beans were in much lowered supply throughout the year, and sold considerably higher as a result. The material began the year at 22c. per pound and rose steadily until in the last week of September 40c. was the prevailing figure. The bean closed the year at this level. This compares with 22c. high and 20c. low in 1916.

Calabar Beans.

In the following table the high and low prices for calabar beans are given for each month of 1917:—

	Per pound—High.	Low.
January	$0.22	$0.22
February	.20	.22
March	.24	.22
April	.28	.25
May	.30	.30
June	.30	.30
July	.30	.30
August	.30	.30
September	.40	.30
October	.40	.40
November	.40	.40
December	.40	.40
Year	.40	.22

Tonka Beans.

Below are set forth the high and low prices for tonka beans in each month of 1917:—

	Per pound—Angostura. High.	Low.	Para. High.	Low.	Surinam. High.	Low.
January	$0.90	$0.90	$0.55	$0.55	$0.60	$0.60
February	.85	.85	.55	.55	.60	.60
March	.85	.85	.55	.55	.65	.60
April	.85	.85	.55	.55	.65	.65
May	.85	.85	.55	.55	.65	.65
June	.85	.85	.55	.55	.65	.65
July	.85	.85	.55	.55	.65	.65
August	.85	.85	.55	.55	.65	.65
September	.85	.85	.55	.55	.65	.65
October	.90	.85	.60	.55	.70	.65
November	.90	.90	.65	.65	.70	.70
December	.90	.90	.65	.65	.70	.70
Year	.90	.85	.65	.55	.70	.60

Vanilla Beans.

Comparison of three leading kinds.

Below are set forth the high and low prices for Mexican, Bourbon and Tahiti vanilla beans in each month of 1917:—

	Per pound—Mexican Whole. High.	Low.	Bourbon. High.	Low.	Tahiti. Green. High.	Low.
January	$4.75	$4.75	$2.50	$2.50	$1.60	$1.55
February	4.75	4.75	2.40	2.35	1.45	1.40
March	4.75	4.75	2.40	2.25	1.45	1.45
April	5.00	4.75	2.25	2.25	1.45	1.45
May	5.00	5.00	2.25	2.25	1.45	1.45
June	5.00	5.00	2.25	2.25	1.45	1.45
July	5.00	5.00	2.15	2.00	1.50	1.45
August	5.00	5.00	2.25	2.00	1.50	1.45
September	5.00	5.00	2.25	2.25	1.50	1.50
October	5.00	5.00	2.50	2.25	1.50	1.50
November	5.00	4.50	2.25	2.00	1.50	1.42½
December	5.00	4.75	2.00	2.00	1.42½	1.42½
Year	5.00	4.50	2.50	2.00	1.60	1.42½

Mexican.

Whole.

A summary of the high and low prices for Mexican whole beans during recent years follows, the basis being the cheapest goods on the market:—

MEXICAN WHOLE BEANS.

	Per pound—High.	Low.
1900	$11.00	$9.00
1901	9.00	6.75
1902	6.75	4.75
1903	6.50	5.00
1904	5.00	3.75
1905	3.50	2.75
1906	2.75	2.75
1907	4.25	2.75
1908	4.25	3.00
1909	3.25	2.75
1910	3.37½	2.75
1911	4.00	2.75
1912	5.00	3.50
1913	4.00	3.62½
1914	5.00	3.50
1915	3.75	2.50
1916	5.00	3.75
1917	5.00	4.50

Cuts.

A comparison of quotations for Mexican cuts in the local trade is afforded by the following summary:—

MEXICAN CUTS.

	Per pound—High.	Low.
1900	$9.00	$7.75
1901	8.00	5.75
1902	5.75	3.25
1903	4.00	3.50
1904	3.50	2.50
1905	2.50	1.50
1906	2.15	1.75
1907	3.87½	2.00
1908	3.75	2.00
1909	2.62½	2.25
1910	3.12½	2.25
1911	3.75	2.87½
1912	3.85	3.20
1913	3.25	3.20
1914	3.50	2.75
1915	3.25	2.25
1916	3.75	3.25
1917	3.75	3.50

Bourbon Beans.

The following table shows the high and low levels of Bourbon vanilla beans in the local market during the last fifteen years:—

BOURBON BEANS.

	Per pound—High.	Low.
1900	$4.50	$4.00
1901	4.75	3.00
1902	3.00	2.50
1903	2.50	1.50
1904	1.50	1.50
1905	1.50	1.00
1906	1.50	1.00
1907	3.00	1.25
1908	3.00	1.50
1909	3.00	1.75
1910	3.00	2.75
1911	3.75	2.75
1912	4.50	3.00
1913	3.10	2.75
1914	4.50	2.75
1915	3.50	2.25
1916	2.75	2.50
1917	2.50	2.00

Essential Oils.

The year 1917 brought out aggravated conditions which were governing factors in 1916. Foreign oils became increasingly scarce, and German, Austrian, Hungarian, Bulgarian and Turkish oils were practically off the spot market early in the year. Prices have ranged high for the entire period by reason of restricted stocks, high transportation, marine, war risk and kindred charges, which became magnified as the submarine danger became more oppressive. Toward the end of the year the Italian Government took over the entire oil from citrus fruits industry in an effort to create a more even market. The situation went hand in hand with the weakening of lemon, lime and orange oils. None of them was strong during the year, and a curve of the price fluctuations of the three would reveal an almost constantly descending line. In the month of January lemon oil touched the high level for the year—$1.20 per pound. From then to the end of the year the price lowered, with slight recoveries to but further emphasize the next decline. It closed the year at $1.05. Orange oil began the year at $3.00 per pound, and up to the end of May fluctuated mildly to as low a figure as $2.80. In June the high level of the year was reached, when the material sold at $3.10 per pound. From June to the end of the year the decline was steady, to the closing quotation of $2.65 per pound.

Oil of almond, bitter, was in light supply throughout the year, but demands were not over strong, and for this reason the oil was steady through the entire period. The opening price for the year was $12 per pound, and this price ruled until the week of June 25, when an advance to $12.50 was noted. This new figure prevailed until the third week in November at which time the market advanced to $13. At the end of December, demands fell off and the material closed the year at $12.75. The artificial almond oil was firm for the entire year. The material was in better supply and the oil, beginning the year at $5 per pound, fell to $4.25 in April. This price ruled for the next seven and a half months. In the last week of November, a stronger tone developed and the end of the year found the oil standing firmly at $4.50.

Bergamot oil was fairly steady throughout the year. In January the material was quoted at $6.25 per pound, which was the high point for the year. Four months later the low point was reached at $5.50 per pound, but, under the decrease of imports, which was a controlling element in the market, recovery was rapid, and at the end of the month the oil stood at $6.00 per pound. In June it again touched $6.25, but at the end of the month it stood at $6.00. It remained there until the end of the year, with the exception of a single fluctuation to $5.95 per pound in the third week of September. It returned to $6.00 the next week.

Oil of cassia was one of the strongest elements in the market. It began the year at $1.07½ per pound for the 75 to 80 per cent technical material. At the end of the six-month period the material was recorded at $1.25 per pound, and at the close of the year at $1.60 per pound. Other grades of the oil advanced over the period, and the

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upward movement was in all cases due to the high cost of the raw material. Demands were heavy, of course, and the two items produced a firm condition for the entire year. Oil of cloves developed great strength through the year. In January the material sold at $1.25 per pound in cans, and as the raw material began to get scarcer and advance in price, oil moved upward, and in June $2.00 was the price commanded. Supplies of the commodity became curtailed, and between June and November 17 rapid uplifts were the rule, the top price for the year being reached on the 17th, when $4.00 per pound was quoted. Gradually demands fell away, and, with the prospect of fair increases in supplies of raw material, the price weakened from the $4.00 mark until at the end of the year $3.50 per pound was the ruling quotation. Oil of juniper berries remained in nominal position at $15.00 per pound. Oil of mustard was very firm throughout the entire year, beginning at $22.00 per pound and closing at $30.00 per pound. Oil of sassafras was higher through the year, lowered supplies and difficulties of replacement being the principal causes of the advance from the January price of 80c. to the December quotation of $1.65 per pound. Peppermint oil was firmer, due to short crops in producing centers where labor was said to be scarce. The range was from $2.20 to $3.30 per pound.

There were few items in the essential oil group which were not at higher levels at the end of the year, and the market was firm throughout the period.

Almond.

Below are set forth the high and low prices for almond oil in each month of 1917:—

	Per pound			
	Bitter.		Artificial.	
	High.	Low.	High.	Low.
January	$12.00	$12.00	$5.00	$5.00
February	12.00	12.00	5.00	5.00
March	12.00	12.00	5.00	5.00
April	12.00	12.00	5.00	4.25
May	12.00	12.00	4.25	4.25
June	12.50	12.00	4.25	4.25
July	12.50	12.00	4.25	4.25
August	12.50	12.00	4.25	4.25
September	12.50	12.00	4.25	4.25
October	12.50	12.00	4.25	4.25
November	13.00	12.50	4.50	4.25
December	13.00	12.75	4.50	4.50
Year	13.00	12.00	5.00	4.25

Bergamot.

A monthly summary of high and low prices for bergamot oil during the last year follows:—

	Per pound—1917	
	High.	Low.
January	$6.25	$6.25
February	6.00	5.75
March	6.00	5.75
April	6.00	5.50
May	6.00	6.00
June	6.25	6.00
July	6.00	6.00
August	6.00	6.00
September	6.00	5.95
October	6.00	6.00
November	6.00	6.00
December	6.00	6.00
Year	6.25	5.50

Lemon.

A summary of high and low quotations for lemon oil for each month during the last year follows:—

	Per pound—1917	
	High.	Low.
January	$1.20	$1.15
February	1.20	1.20
March	1.20	1.10
April	1.15	1.10
May	1.15	1.15
June	1.15	1.15
July	1.15	1.10
August	1.10	1.10
September	1.10	1.05
October	1.10	1.05
November	1.05	1.05
December	1.05	1.05
Year	1.20	1.05

A record of high and low prices by years from 1901 to 1916 follows:—

	High.	Low.		High.	Low.
1901	$1.15	$0.80	1910	$0.82½	$0.75
1902	.80	.65	1911	1.65	.80
1903	.70	.55	1912	2.10	1.30
1904	.55	.50	1913	4.75	2.20
1905	.57½	.55	1914	3.75	1.05
1906	1.20	.57	1915	1.25	.95
1907	2.00	1.00	1916	1.05	.90
1908	1.50	.70	1917	1.20	1.05
1909	3.00	.72½			

Orange.

Below are set forth the high and low prices for sweet orange oil in each month of 1917:—

	Per pound			
	Italian.		West Indian.	
	High.	Low.	High.	Low.
January	$3.00	$3.00	$2.35	$2.25
February	3.00	3.00	2.35	2.35
March	3.00	2.80	2.35	2.35
April	2.80	2.80	2.35	2.30
May	2.90	2.80	2.50	2.40
June	3.00	3.10	2.60	2.60
July	3.10	3.10	2.65	2.65
August	3.00	3.00	2.65	2.65
September	3.00	3.00	2.65	2.40
October	2.90	2.75	2.40	2.25
November	2.75	2.75	2.25	2.25
December	2.75	2.65	2.25	2.00
Year	3.10	2.65	2.65	2.00

Peppermint.

High and low prices for bulk peppermint oil for the last year are summarized as follows:—

	Per pound—1917	
	High.	Low.
January	$2.20	$2.20
February	2.20	2.20
March	2.20	2.20
April	2.20	2.20
May	2.30	2.20
June	2.50	2.35
July	3.00	2.75
August	3.00	3.00
September	3.55	3.00
October	3.60	3.55
November	3.50	3.50
December	3.40	3.30
Year	3.60	2.20

A record of the high and low prices for the years 1911 to 1916, inclusive, follows:—

	High.	Low.		High.	Low.
1911	$2.90	$2.25	1915	$2.00	$1.35
1912	2.85	2.75	1916	2.30	1.80
1913	3.85	2.75	1917	3.60	2.20
1914	4.60	1.40			

Spearmint.

A summary of high and low prices for spearmint oil during the last year follows:—

	Per pound—1917	
	High.	Low.
January	$1.90	$1.90
February	1.85	1.85
March	1.85	1.85
April	1.85	1.85
May	1.85	1.85
June	2.00	1.85
July	2.50	2.50
August	2.75	2.60
September	3.50	2.75
October	3.65	3.50
November	3.65	3.50
December	3.65	3.65
Year	3.65	1.85

A record of the high and low prices for last four years follows:—

	High.	Low.		High.	Low.
1913	$4.85	$4.00	1916	$1.90	$1.50
1914	4.00	1.50	1917	3.65	1.85
1915	1.75	1.35			

Flowers.

Shortages in labor at the source of supply served to produce a smaller crop than would have been justified under ordinary circumstances. Stocks were subject to severe shrinkage which seemed to be irreplaceable toward the end of the year by reason of transportation congestion and eventually embargoes. American saffron was marketed at prices ranging from 40c. to 75c. per pound. The higher prices which ruled in 1916 were offset in 1917 by the better crop which kept stocks in fair condition despite the low reserves of the Spanish material. Spanish saffron ranged from $11.40 to $12 throughout the year, there being little of the material to be had and the price varying in ratio with the supply. Arnica flowers continued to mount in price until $1.70 per pound was quoted for the material. The scarcity of the flower was felt throughout the year. Lavender flowers were in light supply and the restricted reserve was subjected to a growing inquiry which extended throughout the entire year. At the end of December, the ordinary variety was quoted at 20c. per pound. There was little fluctuation in the material.

Saffron, American.

The following table shows the fluctuations in prices for American saffron flowers in 1917:—

	Per pound—1917	
	High.	Low.
January	$0.75	$0.65
February	.65	.63
March	.65	.65
April	.65	.58
May	.55	.50
June	.50	.45
July	.45	.45
August	.45	.45
September	.50	.45
October	.50	.45
November	.48	.48
December	.48	.48
Year	.75	.45

A record of high and low prices for the last six years follows:—

	High.	Low.		High.	Low.
1910	35	18	1914	60	35
1911	33	18	1915	1.25	32
1912	45	33	1916	2.00	75
1913	45	30	1917	75	45

Saffron Flowers, Spanish.

	Per pound	
	High.	Low.
January	$11.50	$11 40
February	12.00	11.75
March	12.00	12 00
April	12.00	12.00
May	12.00	12.00
June	12.00	12.00
July	12.00	12.00
August	12.00	11.75
September	11.75	11.50
October	11.50	11.50
November	11.50	11.50
December	11.50	11.50
Year	12.00	11.40

Gums.

Evidence developed during the year which tended to show more clearly than ever before the intent of the Japanese camphor monopoly. With consumption at a high level in this country, importations of the crude gum were restricted while the receipts of the Japanese refined camphor increased sharply. Comparing 1916 and 1917, there was a decrease of 77,874 pounds of crude gum and an increase of 180,014 pounds of Japanese refined gum shown by the import record of the United States Government. In January American refiners offered material at 86½c. per pound, with the market in a firm condition. Supplies of the crude gum were not forthcoming from foreign sources, with the result that as demands increased the price on the American refined product was sharply advanced on February 17 to 89½c. The crude gum available was quoted at high rates, and, as refiners were said to be behind on contract deliveries, there was a marked scarcity in supplies on spot. For the next six months this condition continued to be operative. Toward the beginning of June Japanese gum weakened in the primary market, and on July 21 a decline of 5c. per pound was announced by American refiners, which was followed September 8 by another decline of 5c. per pound, placing the material at 79½c. This movement was the result of the increased sharp competition of Japanese camphor brands. This competitive element became strong during the month, and two weeks later, September 19, the material was quoted on spot at 74½c. per pound—the low point for the year. It was also held that the releasement of large quantities of Japanese gum was a working cause in the declines. On November 24 the beginning of a series of uplifts was reported. The price was advanced on that date to 76½c. per pound, and was due largery to the scarcity of supplies. Imports of crude gum in the month of November were strikingly smaller than during the same period in 1916. Imports in the month of November, 1916, were 516,314 pounds, which compared with 272,255 in 1917, showing a loss of 244,059 pounds for the month. Japanese refined material fluctuated between 93c. and 74c. per pound over the year. The high point was struck in March, and from then to the end of the year rise and fall in price were frequent.

Tragacanth continued in scant supply throughout the year. There was no Turkish gum to be purchased at any price on spot. Nominally, it was quoted at $2.75 for firsts, $2.25 for seconds and $2 for thirds, but a single pound of any of these would have brought over $15 per pound. Aleppo material was in demand as a consequence of this failure of the Turkish supply. Firsts were quoted at $2.30 for a high point and $2.15 as a low level. Seconds reached the high and low point in January, when the material was quoted at $2 in the first week and at $1.70 in the third. The material closed the year at $1.80. This curious condition obtained for thirds, too. The high was $1.90 and the low $1.40, both January quotations. The December quotation was $1.50. Aloes were steady throughout the year. Supplies of the material reached this country in small lots, which held the market firm. The high was 9½c. per pound, reached in July, and the low 8c., reached in November. Gum arabic was in light supply. By the end of the year seconds and thirds had been exhausted and were nominal. All grades advanced as the demands ate in on the restricted stocks, which were replaceable in a small way only.

Cleaned amber sorts ranged from 16c. to 32c., which compares with 15c. to 25c. in 1916.

Aloes, Curacao.

The following shows the prevailing high and low prices for Curacao aloes in cases in each month during 1917:—

CURACAO ALOES, IN CASES AND GOURDS.

	Cents per pound			
	Cases.		Gourds.	
	H.	L.	H.	L.
January	9¼	9	20	20
February	9¼	9¼	20	18
March	9	9	17	17
April	9	9	17	17
May	9	9	17	17
June	9	9	17	17
July	9½	9	17	17
August	9	9	17	17
September	9	9	16	16
October	9	9	16	16
November	9	8	15	15
December	8	8	15	15
Year	9½	8	20	15

A summary of the high and low prices for Curacao aloes in cases in the last eight years follows:—

	Cents per pound	
	High.	Low.
1910	8¾	6¾
1911	8	6½
1912	11½	7¾
1913	11	6½
1914	16	8
1915	15	11½
1916	14	9
1917	9½	8

Arabic.

In the following table the high and low prices for amber sorts of gum arabic are given for each month of 1917:—

	Cents per pound	
	High.	Low.
January	16	16
February	19	17
March	18	17½
April	18	18
May	19	18
June	20	20
July	30	22
August	31	30
September	32	31
October	33	33
November	32	32
December	32	32
Year	33	16

Camphor.

American, Refined.

High and low prices for American refined camphor in bulk, by months, for 1917 are shown in the following summary:—

	Cents per pound, bulk, in barrels.	
	High.	Low.
January	86½	86½
February	89½	86½
March	89½	89½
April	89½	89½
May	89½	89½
June	89½	89½
July	89½	84½
August	84½	84½
September	84½	74½
October	74½	74½
November	76½	74½
December	76½	76½
Year	89½	74½

A record of the high and low prices for the seven previous years follows:—

	High.	Low.
1910	45	42
1911	49½	42
1912	44	44
1913	44	42
1914	59½	41
1915	44½	41
1916	86½	42
1917	89½	74½

Japan Refined Camphor, 2½-lb. Slabs.

	Cents per pound	
	High.	Low.
January	90	89
February	90	88
March	93	88
April	90	88
May	88	88
June	88	85
July	80	75
August	75	70
September	75	75
October	75	74
November	74	74
December	74	74
Year	93	70

Tragacanth.

The following tables show the high and low prices in each month of 1917 for the first, second and third qualities and sorts of Aleppo gum, and also for the first, second and third qualities of Turkish gums:—

	Dollars per pound							
	Firsts.		Seconds.		Thirds.		Sorts.	
	H.	L.	H.	L.	H.	L.	H.	L.
Jan.	2.25	2.15	2.00	1.70	1.90	1.40	0.75	0.55
Feb.	2.30	2.25	1.95	1.70	1.65	1.40	.70	.55
March	2.30	2.30	1.95	1.95	1.65	1.65	.70	.70
April	2.30	2.30	1.95	1.95	1.65	1.65	.70	.70
May	2.30	2.30	1.95	1.95	1.65	1.65	.70	.70
June	2.30	2.30	1.95	1.95	1.65	1.65	.75	.75
July	2.30	2.30	1.95	1.95	1.65	1.65	.75	.75
Aug.	2.25	2.25	1.95	1.95	1.65	1.65	.75	.75
Sept.	2.25	2.25	1.95	1.95	1.65	1.65	.75	.75
Oct.	2.25	2.25	1.95	1.95	1.65	1.65	.75	.75
Nov.	2.25	2.15	1.95	1.80	1.65	1.50	.75	.75
Dec.	2.15	2.15	1.80	1.80	1.50	1.50	.75	.75
Year	2.30	2.15	2.00	1.70	1.90	1.40	.75	.55

Turkish.

	Per pound					
	Firsts.		Seconds.		Thirds.	
	H.	L.	H.	L.	H.	L.
January	$2.75	$2.75	$2.25	$2.25	$2.00	$2.00
February	2.75	2.75	2.25	2.25	2.00	2.00
March	2.75	2.75	2.25	2.25	2.00	2.00
April	2.75	2.75	2.25	2.25	2.00	2.00
May	2.75	2.75	2.25	2.25	2.00	2.00
June	2.75	2.75	2.25	2.25	2.00	2.00
July	2.75	2.75	2.25	2.25	2.00	2.00
August	2.75	2.75	2.25	2.25	2.00	2.00
September	2.75	2.75	2.25	2.25	2.00	2.00
October	2.75	2.75	2.25	2.25	2.00	2.00
November	2.75	2.75	2.25	2.25	2.00	2.00
December	2.75	2.75	2.25	2.25	2.00	2.00
Year	2.75	2.75	2.25	2.25	2.00	2.00

Herbs and Leaves.

In sympathy with the conditions obtaining in the general list of botanicals, herbs and leaves went through a year of trading which drained stocks seriously, brought out higher positions for some items, held practically all the others at least to the levels established during the previous year and closed the year firm and sustained in nearly all directions.

Both varieties of buchu leaves fluctuated normally throughout the year. The short leaves were in the third week in February quoted at $1.35 per pound, and this was the high level for the year. The following months brought out declines in quotations which were but temporarily disturbed by slight upward turns. At the end of the year the material sold at $1.15 per pound. The long leaves were somewhat quieter. The high level was reached in February, when a $1.35 figure was noted. This price held until the last week in April, when the price was $1.30. Until the third week in October this price was registered; but in the third week the price moved downward to $1.25 per pound and this figure ruled until the end of the year. Belladonna scored heavily during the year, as supplies of the material were not forthcoming from the cultivation centers and spot stocks became nearly if not quite exhausted. Beginning the year at $1.35 per pound, the price mounted until in March $1.60 per pound was quoted. Slightly better supplies became available by May and as demands fell off to some degree the material was marked down to $1.45 per pound. Recovery was rapid, however, for June 1 the price again jumped upward and the commodity was sold in the New York market on a basis of $1.50 per pound During the month the demands were active in making severe inroads on the supplies and with shipments curtailed the price moved in the last week of the month to $1.60 per pound, at which level it remained, with the exception of a momentary falling to $1.55 per pound in the first week in September. Two weeks later the material recovered its $1.60 mark, at which position it ended the year. Henbane was in high position for nearly the whole year, but heavy arrivals from abroad as well as the release of material held within the country caused a break in the market in December to $2 per pound. Damiana leaves continued in scanty supply during the year and the material closed the year at 15c. per pound. Imported sage and marjoram were almost impossible to obtain throughout the year. Even the French marjoram was nominal at the end of the year.

Buchu.

High and low prices for short buchu leaves for the last year are set forth as follows:—

BUCHU SHORT AND LONG.

	Per pound			
	Short.		Long.	
	High.	Low.	High.	Low.
January	$1.20	$1.20	$1.25	$1.25
February	1.35	1.20	1.35	1.25
March	1.35	1.30	1.35	1.35
April	1.30	1.25	1.35	1.30
May	1.25	1.25	1.30	1.30
June	1.28	1.28	1.30	1.30
July	1.28	1.25	1.30	1.30
August	1.20	1.20	1.30	1.30
September	1.25	1.20	1.30	1.30
October	1.25	1.20	1.30	1.25
November	1.20	1.15	1.25	1.25
December	1.15	1.15	1.25	1.25
Year	1.35	1.15	1.35	1.25

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A summary of the high and low prices for the short leaves in the last five years follows:—

	High.	Low.
1912	$1.65	$0.95
1913	1.50	1.25
1914	1.85	1.30
1915	1.55	1.05
1916	1.30	1.15
1917	1.35	1.15

Belladonna Leaves.

The following table shows the high and low prices in each month of 1917 for belladonna leaves:—

	Per pound— High.	Low.
January	$1.45	$1.35
February	1.50	1.45
March	1.60	1.60
April	1.60	1.60
May	1.45	1.45
June	1.60	1.50
July	1.60	1.60
August	1.60	1.60
September	1.60	1.55
October	1.60	1.60
November	1.60	1.60
December	1.60	1.60
Year	1.60	1.35

Roots.

Few if any of the root group seriously declined during the year. High prices ruled without exception. Golden seal root was uneasy throughout the year, selling as high as $5.75 per pound under heavy demand for export and as low as $5 per pound, at which price it opened the year. Within four months the price had advanced to $5.75 per pound, from which figure it dropped to $5.35, the ruling figure at the close of the year. This downward movement was not steady, the material showing temporary reactions upward during the period . Cartagena ipecac began the year at $2.25, rose under depressed supplies until at the end of the month the material sold for $2.50 per pound. For a month this price ruled and then downward movements set in and by the end of April, a $2 price ruled. From then to the end of the year nothing but a general uplift was noted in the quotations for the material. At the end of December, the high level for the year was ruling at $3.10. The history of the root was one of constantly decreasing supply under increasing demands. Shipment problems were operative in this material as they are in all goods imported.

As was predicted by many sellers of the material, jalap was constantly in supply minor to the demands and the price curve of the material shows a constant rise in quotations from 12c. per pound at the beginning of the year to 50c. per pound, the ruling price in December. Little Mexican sarsaparilla was in the spot market at any time during the year and by the end of October, quotations were nominally at 60c. per pound. The material was quoted in January at 13½c. per pound and in December at 60c. per pound with no declines registered during the 12 months. Belgian valerian was the only type obtainable by the close of the year. Previous to the war, the material sold on spot at 7c. per pound and at the close of 1917, the market price was $1.10 per pound.

Golden Seal.

High and low prices for golden seal root in each month of 1917, together with those for the two years previous, are shown in the following summary:—

	Per pound— High.	Low.
January	$5.20	$5.00
February	5.20	5.20
March	5.35	5.20
April	5.75	5.35
May	5.75	5.75
June	5.75	5.50
July	5.50	5.25
August	5.30	5.25
September	5.35	5.30
October	5.55	5.30
November	5.35	5.35
December	5.35	5.35
Year	5.75	5.00

A record of the high and low prices for the six previous years follows:—

	Per pound— High.	Low.
1912	$5.25	$4.00
1913	5.00	3.90
1914	4.90	4.20
1915	4.85	4.20
1916	5.50	4.25
1917	5.75	5.00

Ipecac.

The following table shows the high and low prices in each month of 1917 for Cartagena and Rio ipecac root:—

	Per pound— Cartagena. High.	Low.	Rio. High.	Low.
January	$2.50	$2.25	$3.00	$3.00
February	2.50	2.50	3.00	3.00
March	2.30	2.10	3.00	3.00
April	2.10	2.10	3.00	2.80
May	2.20	2.00	2.80	2.80
June	2.35	2.20	2.80	2.50
July	2.50	2.25	2.60	2.50
August	2.50	2.50	2.60	2.60
September	2.50	2.50	2.60	2.60
October	2.50	2.50	2.60	2.60
November	2.50	2.50	2.60	2.60
December	3.10	2.50	3.10	2.60
Year	3.10	2.00	3.10	2.50

Cartagena.

A summary of the high and low prices for Cartagena root for the last seven years follows:—

	Per pound— High.	Low.
1911	$2.30	$1.75
1912	2.35	1.45
1913	2.20	1.75
1914	2.00	1.42½
1915	5.50	1.70
1916	2.65	2.55
1917	3.10	2.00

Jalap.

The following table shows high and low prices for jalap root for each month in 1917:—

	Cents per pound— High.	Low.
January	12	12
February	12	12
March	12	12
April	12	12
May	13	12
June	13	13
July	13	12½
August	16	13½
September	28	16
October	50	28
November	50	50
December	50	50
Year	50	12

A record of high and low prices for the past seven years follows:—

	Cents per pound— High.	Low.
1911	40	22
1912	26	22
1913	23	13
1914	20	10
1915	10	8
1916	12	8¾
1917	50	12

Sarsaparilla.

Mexican.

The high and low quotations for Mexican or Tampico sarsaparilla root each month during the last year are shown in the following summary:—

	Cents per pound— High.	Low.
January	13¾	13½
February	15	14½
March	18½	17½
April	19	18½
May	25	19
June	25	25
July	25	25
August	27	26
September	37	30
October	50	39
November	50	50
December	60	50
Year	60	13½

A record of the high and low prices for the eight previous years follows:—

	Cents per pound— High.	Low.
1910	11	8¾
1911	18½	9
1912	19	11
1913	28	14
1914	50	10
1915	15	9
1916	33	10½
1917	60	13½

Senega.

Northwestern.

High and low prices for senega root in each month of 1917 are shown as follows:—

	Cents per pound— High.	Low.
January	65	63
February	68	68
March	68	64
April	64	63
May	63	62½
June	62	60
July	61½	60
August	68	61½
September	85	80
October	85	82
November	82	80
December	80	80
Year	85	60

A record of high and low prices for the eight years follows:—

	Cents per pound— High.	Low.
1910	50	43
1911	60	42
1912	65	59
1913	80	63
1914	50	38
1915	45	35
1916	68	40
1917	85	60

Seeds.

Inability to secure shipments from the source of supplies has tended to hold the seed market in a firm position for the year. Stocks toward the end of the year became rapidly exhausted and several items were not to be found in the spot market. Among these were: Levant and Italian anise, Smyrna and Dutch canary, Dutch poppy, and there were several varieties of seed which were in a state of near exhaustion. Canary seed was in low supply and the price for the Smyrna grade remained nominally at 7½c. for the year. As a matter of fact, there was hardly any of this seed to be had at the beginning of the year and absolutely none at the close. South American was in better supply and ranged easily from 5¼c. to 8½c. per pound. The price on the material rose gradually and the advance increased as the stocks shrunk. Small parcels of the Dutch seed were to be had with the opening of the year but, with trade conditions seriously interrupted by the inability of Washington to secure an agreement with the Dutch government relative to the sale of foodstuffs to Germany, steamers were tied up in the New York port and importation of Dutch articles practically ceased. This was the position of caraway seeds, which were reported until October, when the supply became exhausted and no replacements were possible. The progress in this material's price was constantly toward higher levels and the last sales were reported at 61c. per pound. Celery seed advanced in price during the year until at the end of December an advance of 10c. per pound was noted. The material was subjected to considerable fluctuation in price owing to the varying play of supply and demand. Flaxseed was high the whole year, $14 per barrel being the last quotation in December. Short crops was the reason. Dutch poppy seed became exhausted on spot early in the year. Last sales were made at 75@76c. per pound.

Canary.

Below are set forth the high and low prices for canary seed in each of the months of 1917:—

	Cents per pound— Smyrna. High.	Low.	American. High.	Low.	Dutch. High.	Low.
Jan.	7	5¾	5¼	4¾	4¾	4½
Feb.	7	7	5½	5½	4¾	4¾
March	7	7	5½	5½	5¼	5¼
April	7	7	5¾	5¼	5¼	5¼
May	7	7	5	4¾	5¾	5¼
June	7	7	4¾	4½	5¼	5
July	7	7	4½	4½	5	4½
Aug.	7	7	4½	4½	4½	4½
Sept.	7	7	4¼	4	5	4½
Oct.	7	7	4¾	4¼	5	5
Nov.	7	7	4½	4¾	5	5
Dec.	7½	7	5¾	5	5½	5
Year	7½	5¾	5½	4	5¾	4½

Caraway.

A summary of high and low prices for caraway seed in eac hmonth of 1917 is shown in the following table:—

	Cents per pound— High.	Low.
January	52	50
February	62	52
March	62	62
April	65	60
May	62	60
June	64	62
July	65	64
August	63	60
September	61	61
October	61	61
November	61	61
December	61	61
Year	58	59

A record of the high and low prices for the previous seven years follows:—

	Cents per pound— High.	Low.
1911	6½	5
1912	8	5¾
1913	7¼	5¾
1914	15	7
1915	13½	8¾
1916	51	10¾
1917	65	52

Celery.

High and low quotations for celery seed in 1917 are shown by monthly comparisons as follows:—

	Cents per pound— High.	Low.
January	18½	18
February	25	23
March	24	23
April	23	22½
May	30	25
June	30	27
July	26	26
August	26	26
September	28	27
October	28	27
November	28½	29
December	28	27½
Year	30	18

A summary of the high and low prices for the last six years:—

	Cents per pound— High.	Low.
1912	30	15
1913	45	12
1914	40	14
1915	35	14
1916	30	18½
1917	30	18

Spices.

The spice market has been hectic, nervous, apprehensive, and restless throughout the year. Inability to secure anything like adequate replacement stocks caused the market to maintain a high price level. Practically all the levels achieved during 1916 were not only kept easily, but in practically every case, higher prices developed as the shipping question made it impossible to adequately replace the shrunken stocks. Toward the end of the year all material arriving at New York had been sold on future contract long before the goods reached the wharves. The strongest articles in the list were cassias, chillies, ginger and peppers. Cloves gathered strength gradually as stocks were reduced and in November the material was quoted at 55c. per pound, from which high point it receded until at the close of the year, 44c. per pound was quoted for Zanzibar cloves. This easing in price was primarily due to a somewhat reduced demand, but more to arrivals prospective from the East. The range for the year was 19½c. per pound, the ruling quotation in January, to 55c. er pound the price at which the material was quoted the first week of November.

Cloves.

Zanzibar.

Following is a summary of the high and low points reached by Zanzibar cloves during each month of 1917:—

	Cents per pound— High.	Low.
January	19½	19½
February	22½	20
March	23	22
April	24	23
May	27	24
June	27½	27
July	35½	30
August	34	34
September	42	35
October	53	45
November	55	52
December	51	44
Year	55	19½

The highest and lowest prices for Zanzibar cloves for the last eighteen years:—

	Cents per pound— High.	Low.
1917	55	19½
1916	20	16½
1915	21	15½
1914	22	14½
1913	21½	15
1912	20½	10%
1911	19	12
1910	15½	10
1909	11½	9½
1908	12	10
1907	18½	11
1906	15	13
1905	14½	8½
1904	19	13
1903	10½	7½
1902	9	8
1901	9½	7½

Waxes.

Paraffin continued to be one of the most interesting of the items on the wax list. Export demands were heavy throughout the year; the prices of the crude oil were high, and the natural result was a further augmentation of the already high levels reached in 1916. Exorts of the material were smaller in quantity but greater in value than in 1916. For the eleven months ending November 31 the official government figures were:—1916, 342,399,109 pounds, valued at $13,295,071, which compares with 292,626,442 pounds, valued at $16,-612,082, in 1917. Imports in 1917 were greater, the official figures of the government being: — 7,557,924 pounds, valued at $414,781, in 1916, and 8,438,611 pounds, valued at $593,925, in 1917. The price values of 118 to 120 degrees melting point were, in 1917, on a higher was quoted at 5½c. per pound, which scale as compared with the same material in 1916. In January the material was 1c. per pound below the high and closing price in 1916. By the end of the month 6½c. per pound was quoted, and from then to the end of the year the material advanced until, in December, 10½c. per pound was the closing price. This was the high leevl for the year.

Beeswax advanced at practically the same ratio as it did in 1916. The opening price in January was 33c. per pound, and in December the material stood at 37c. Exports were somewhat less in quantity, but were valued higher. In 1916, 226,711 pounds, valued at $74,520, were exported, which compares with 211,212 pounds, valued at $78,330, in 1917. Carnauba waxes were firm throughout the year, and at the close of the period evidence came out that, owing to the increasing scarcity of the material, due in a large measure to crop failures, higher prices were sure to eventuate. Flor was practically off the spot market at the end of the year, and was quoted nominally at 66@68c. in December. The opening price was 50c. per pound. Other varieties scored similar advances through the year, and were quoted only nominally in December. Candelilla wax in December was subject to nominal quotation only. The range through the year was 23c. in January to 40c. nominally in December. At the end of the year there was so little material to be had that it was safe to say that practically any price could be obtained against buyers' necessity. Ozokerites were nominal in position at the beginning and ending of the year. No material was offered, because of war conditions. Japan wax was rather quiet at the high level at which it closed the year of 1916. In January, 1917, it was quoted at 16c. and at the end of the year at 17c.

Carnauba.

Below are set forth the high and low prices for the North Country No. 3 grade of carnauba wax in each month of 1917:—

	Cents per pound— High.	Low.
January	32½	29
February	35	32½
March	36	35
April	36	36
May	40	36½
June	40	39
July	40½	40
August	40	40
September	41	40
October	42	42
November	48	44
December	47½	47½
Year	48	29

Japan.

The high and low prices for Japan wax by months during 1917 follows:—

	Cents per pound— High.	Low.
January	16	15½
February	15	14½
March	15½	15½
April	15	15
May	14½	14½
June	15½	15
July	15½	15½
August	15½	15½
September	16	15¾
October	16½	16
November	16¾	16½
December	17	16¾
Year	17	14½

SPONGE MARKET.

Scarcity of Some Grades Due to Shipping Conditions.

In reviewing the sponge market for 1917, it cannot be said that there have been any very sensational advances in Florida or Cuba-Bahama sponges by producers. Importers of Levant and Grecian, from the Mediterranean fisheries, as may have been expected, have been able to secure only very limited supplies, the lightest in many decades, but the sheepswool variety has now been fairly well established as a prime requisite of the bath, and the substitute is curtailing the Madruka and Mediterranean sale with seemingly satisfactory results, and, moreover, is a decided help to our Florida producers.

Most sponges offered for bath and toilet use undergo a bleaching process in which certain chemicals are used. The great advance in bleaching chemicals will be observed by a recent trade notice which read:—

"Owing to the high price of permanganate of potash, we shall in future cease using it in bleaching our line of toilet and bath sponges. Sponges, however, will be given a semi-bleach and, although lacking a delicate whitish tint, will still have an attractive look and be found to give longer wear, as the use

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of strong chemicals necessary to decolorize the natural brown of the sponge tends to deteriorate its fibers, rendering it slightly less durable."

The average prices prevailing for Floridas were:—

Rock Island sheepswool forms, prime selections, compressed in bales, less 3 per cent. tare:—		Value.
Large,	1 to 2 to lb. at	£4.80
Large,	2 to 3 to lb. at	4.90
Medium large,	3 to 4 to lb. at	4.95
Medium,	4 to 6 to lb. at	5.00
Medium,	6 to 8 to lb. at	5.15
Medium,	8 to 10 to lb. at	5.15
Medium,	10 to 12 to lb. at	4.90
Medium small,	12 to 16 to lb. at	4.00
Medium small,	16 to 20 to lb. at	3.00
Small,	20 to 30 to lb. at	2.50
Cut, Rock Island sheepswool		4.15
Florida yellow (prime)		1.25
Florida, grass, No. 1		.40

At the old Bahama fisheries, fear has been felt that the fleet might have to cease sponge hooking. The bete noir was the high price of flour and breadstuffs and the uncertainty of supplies, the Ward Steamship Line having been withdrawn temporarily. The catch for the quarter ending September, 1917, was as follows, marketed on the Nassau Sponge Exchange:—

	Pounds.	Value.
Grass sponges	77,960	£6,792
Hard head	9,568	1,176
Reef	18,106	2,727
Velvet	61,269	11,957
Sheepswool	33,451	8,808
Yellow	5,022	696
Sponge clippings	138,184	847

The sponge production of the Bahamas is as follows:—

	Pounds.	Value.
1913-1914	1,827,492	£151,525
1914-1915	1,142,547	93,395
1915-1916	1,628,938	147,021
1916-1917	1,296,785	138,190

Under existing conditions and high cost of outfitting, the trade can look for and expect an advance in sponges during 1918.

There was a gratifying increase in the shipments of sponges, including waste, from the Bahama Islands to the United States during 1917, according to U. S. Consul W. F. Doty at Nassau, their value increasing from $277,241 for 1916 to $340,473 for 1917, and by weight from 367,778 pounds in 1916 to 1,090,513 pounds in 1917. Prices at New York remained almost stationary during the past two years, averaging about $2.10 per pound for best quality of wool spongie, occasionally rising to $2.30. Velvet usually was sold at from $1.32 to $1.35, with a maximum of $1.50 per pound. The smaller size of reef sponge brought about $1.60 per pound, while $1.20 was realized for the large size. Forms of hardhead No. 1 averaged $1.20, with cuts at 70c.; 62c. was the price of No. 1 yellow, while No. 1 grass was worth 60c. per pound. Slate is the refuse of all grades and slate reef ranged from 25c. to 30c. per pound. The past year is likely to mark the maximum results in sales for some time to come, as the shipment to Europe, owing to the transportation problem, has become increasingly difficult.

French Vanilla Bean Market for 1917.

Advices from our regular Paris correspondent indicate that the French vanilla bean market during 1917 was marked by many unusual features. Arrivals of beans from the islands were slow and were made only after unusual difficulties. Beans purchased in July at Reunion Island and shipped to Marseilles did not reach that port until December, and still further trouble was experienced in shipping goods from Marseilles to Paris as transportation was interrupted constantly.

The import regulations are such that no manifests can be published and the usual complete account of number of cases of beans arriving and of marks and firms receiving the goods have been lacking, hence being without definite information as to arrivals the handlers of vanilla beans have been unable to quote prices on any established basis. Stocks are unknown and prices are moving in consequence from 15 to 20 francs.

Report on Tahiti Vanilla Beans, 1917.

The price of these beans for the season 1917-1918 has fluctuated even more severely than in the past year. While the market for Green Label ranged from $1.25 to $1.30, the price dropped at the close of the year to as low as $1 a pound. This was occasioned partly by legislation in regard to the use of alcohol, which, while creating a temporary demand for the lower-priced beans, also was the cause of a flurry in a few houses who desired to unload, anticipating that they would be stuck with the stocks which they had on hand. The other qualities were reduced in proportion, Yellows demanding 5 cents, and White Label 15 cents more than Green.

The European trouble has almost eliminated the opportunity of making shipments to London or the Continent, and, in fact, the demand from these countries has been exceedingly small on that account, while importations into Russia have been practically nil.

Against this has to be taken into consideration the fact that the efforts of the French Government to combat the disease of the vanilla beans have been almost fruitless, and latest reports indicate that planters are eradicating their vines in preference to fighting what is almost considered an incurable disease. The importations into this country have decreased very much and the stocks that are held at the present time do not amount to nearly the proportions that were held at the close of 1916.

There has been a little better demand in the East for the higher class label, many users having found that our contention regarding the intrinsic value of contents of the higher priced and better quality beans is a correct one. This is an advantage in many respects, in fact, planters who are sticking to the cultivation of these beans are using more care in the development and curing of the beans, with a result that the tendency is toward the White Label, which is, of course, a perfect bean.

The importations from March to December totaled 2,528 cases, against 2,200 tins in 1916, 3,150 tins in 1915, 3,012 in 1914 and 4,302 in 1913.

Imports at San Francisco.

Receipts of Tahiti vanilla beans at the port of San Francisco during the year 1917 totaled 287,792 pounds. The entry by months is as follows:—

Months.	Pounds.
January	7,501
February	22,144
March	25,576
April	12,479
May	10,927
June	22,776
July	27,672
August	30,492
September	38,233
October	....
November	....
December	89,992

Remarkable Yield of Newfoundland Codliver Oil in 1917.

During the past year Newfoundland has seen the most successful cod fishery in its existence. Not alone has there been more codfish caught, but the fish were in excellent condition and the yield of oil was remarkable.

We have no means of giving any exact figures until the correct government exports are published at the end of the official year, on June 30, so that we can only estimate results for the past season; but we know enough to substantiate the above facts.

With present values for fish and fish oil, we have all been free sellers, and with a good demand all the year we find ourselves at the present time with stocks of both fish and oil almost exhausted.

The price of common cod oil for tanning purposes has advanced nearly 500 per cent. since the war started, and the fishermen can realize on these livers without any cost to him by throwing them into any puncheon and within a few days during the summer it has decomposed and the oil drawn off.

The fishermen who have weekly advices from their unions know exactly what they can do; therefore, when a refiner wants to manufacture the medicinal article he must now be prepared to pay the fishermen a fancy price for the fresh livers. There has been an extraordinary advance in price of the common cod oil during the past two months; therefore, the fishermen are all greatly disappointed at not getting a corresponding advance, and will govern themselves accordingly during the coming season.

We cannot expect to get big fisheries all the time, and neither can we expect to get such a good yield of oil from the livers next season; therefore, there is nothing ahead of the refiners except to advance the price of oil, and if there is any trouble to dispose of the oil, it will only mean a very short supply for all concerned, as our fishermen are so independent that we cannot reason with them, and must pay the price.

There is not an idle man in Newfoundland today; every trade is taxed to the limit, and the shipbuilding industry has surpassed all expectations.

There is great difficulty to obtain tin for the manufacture of the tin-lined barrels, and unless there is some arrangements made the druggists will have to take their supply of oil in the old-fashioned 50-gallon wooden barrel for the duration of the war.

Refiners have so many difficulties ahead of them that no one will take risks in selling unless the oil is actually secured.

The Newfoundland Government is carrying out the inspection act in a rigorous and impartial manner, and it has made a wonderful improvement in the quality of oil now produced here.

The following are the statistics of exports of medicinal codliver oil to the end of June each year:—

Exports of Codliver Oil.

Year.	Gallons.	Value.
1903-1904	191,403	$482,792
1904-1905	114,606	137,266
1905-1906	59,781	34,995
1906-1907	51,547	31,375
1907-1908	48,015	26,206
1908-1909	66,780	31,604
1909-1910	44,307	26,464
1910-1911	83,999	58,607
1911-1912	51,277	42,300
1912-1913	36,484	18,122
1913-1914	26,118	17,010
1914-1915	47,170	35,837
1915-1916	142,637	254,562
1916-1917	214,162	471,629

Review of Crude Glycerines in France During the Year 1917.

Paris, Dec. 31, 1917.

The year 1917 ended with a firm market and the price for the saponification glycerine was $38@39 loose, net, for cash per 100 kilos, and for soaplye glycerine the price was $26 per 100 kilos, with regular business active.

In January the market was firm for saponification glycerine. The price of $40@41 per 100 kilos, loose, was made for delivery in the first quarter. Soaplye glycerine held the same level as in December, being noted at $25@26 per 100 kilos, with very little business.

In February saponification reached $42 per 100 kilos, loose, with regular business moderate because of the rarity of offers. The soaplye glycerine remained unchanged.

In March regular business in saponification glycerine was little active, with the price varying from $42 to $43. On the other hand, transactions in soaplye glycerine were most active; come hundreds of tons were handled at $28 per 100 kilos for delivery until the end of March. Part of this was for the British Government and part for native consumption.

In April the market for saponification was strengthened and handled at the firm price of $43 to $46 per 100 kilos, loose. The market price of soaplye was held at $28 per 100 kilos, loose, without offers.

In May saponification continued to grow stronger and attained $52 per 100 kilos, loose. Soaplye glycerine followed the movement and some business was transacted at $30@31 per 100 kilos, loose.

In June saponification, which had attained $53 at the beginning of the month, dropped to $51 at the end of the month, with regular business moderate. Soaplye glycerine had been sought for at the firm price of $33@34 per 100 kilos without much success.

In July the regular business was very limited because of the decrease in production due to the considerable advances in price of the chief materials and their scarcity. Regular purchases did not go beyond $50 per 100 kilos, loose, for saponification and $35 for soaplye, prices fixed by the government.

In August the situation remained the same as in July, with rare exceptions, in which saponification sold at $75 to certain consumers who could not secure supplies from their customary contractors.

In September some small lots of saponification were handled by some small consumers at prices varying from $70 to $80 per 100 kilos, loose. Then the regular purchasers did not go beyond $50 for saponification or $35 for soaplye.

In October the regular purchasers found themselves in the same situation as before. The small consumers paid up to $84 per 100 kilos for saponification. Some business in soaplye glycerine was handled at $35 per 100 kilos, loose, ta be delivered to the end of the year.

In November there was not much change concerning the regular purchasers, who did not go beyond $50 per 100 kilos, loose, for saponification and $35 per 100 kilos for soaplye. Saponification then attained $90 afterwards for some small new purchases which were made for special needs.

In December the government raised its limits to $60 per 100 kilos, loose, for saponification and to $45 for soaplye glycerine, reserving for itself the control of all operations.

Toward the end of the year some important business was transacted in soaplye glycerine at $45 per 100 kilos, loose, deliverable in installments during the first half of 1918. Nothing was handled in saponification, the production of which, always below requirements, was totally absorbed by war needs.

These are the difficulties created by the law of supply and demand, by the high cost of chelf materials, by the want of coal, and by the crisis in transportation. These factors have brought about the present situation in the cost of the articles.

Chicago Glycerine Market for 1917.

The demand for glycerine in this market was probably greater during the year 1917 that ever before, but the available supply was considerably curtailed by the heavy falling off in imports. This was counteracted to some extent by the heavy importation of glycerine-bearing oils from the Orient, among the most popular of which was cocoanut oil. Whereas in former years perhaps 40 per cent. of the crude glycerine used in the United States was imported from England, the imports this year were negligible.

Chemically pure was perhaps the strongest branch of the market, with dynamite glycerine running a close second. Crude glycerine, of course, took its cue from dynamite, and also was strong throughout the year.

The year 1917 opened with dynamite selling at 49 cents and chemically pure at 50½ cents per pound, f. o. b. shipping point, on January 3. With theh exception of a one-day drop to 48 cents, chemically pure climbed steadily and in the fall of the year went up to 70 cents per pound. Later the market grew a little easier and sold down to about 65 cents, at which figure the year closed.

Because of the limited available supply and the high prices trading in 1917 was done in smaller units than in previous years. Men who used to buy ten or more cars at a time in former years confined their purchases to five cars or less in 1917. Not only that, but whereas traders in 1915 would come into the market and follow its course right through, buying on a rising market, this year traders were in and out on short notice. Few stayed in the field for any great length of time.

Contract buying for a six-months period also became more popular in 1917, the primary motive being to save money. Thus in October and November many contracts were made for delivery during the first six months of 1918. Glycerine which brought 65 cents per pound on prompt delivery could be contracted for at 61 cents for future delivery.

Consumers were almost wholly dependent upon American crude glycerine in 1917. Eighty per cent. crude opened the year with buyers' ideas at 35 cents per pound and no transactions reported. Saponification was held at about 38 cents per pound at this time. These grades gained steadily during the year, selling at the close of 1917 at about 10 cents per pound above the price at which the opening of the year found them.

ADVANCE IN ALL GRADES OF SHELLAC MARKED CLOSE OF THE YEAR 1917

The advance in all grades of shellac was marked at the end of the year. Shipments from the primary market were small as compared with those of previous years, and conditions of transportation from the Pacific coast East were such that five or six months would be consumed in rolling to the Atlantic coast.

Consumption of the material gained during the year. Demands grew in the same ratio as receipts fell off. Likewise did the quotations advance over the period. Illustrative of these facts are the official figures of the Department of Commerce. These import statistics are as follows:—1916, 31,132,320 pounds, valued at $5,075,885; 1917, 27,460,757 pounds, valued at $9,040,243.

Illustrating the situation in yet another manner, a study of the fluctuating prices covering the year are illuminative. T. N. began the year at 39c. per pound—the low figure for the year—and under the influences already mentioned, rose to the high figure, 62c. per pound, by the third week in May. The curve then drops back to 45c. in the last week in October. From then to the end of the year the curve is upward and the closing price for the year came out at 58c.

The high grades of gum were in quite the same situation. D. C. and V. S. O. began the year at 48c. and 49c. respectively. The progress of the materials' price development was generally upward, with slight turns back as complicating elements entered the general situation. The high price for the year was 73c. per pound for each grade of material, and this point was reached in December. At the close of the year there was very little of these high grades left, and holdings were restricted to one or two hands.

The consistent upward climbing of T. N. material in the Londan markets is illustrated by the price quotations, 142 shillings quoted in January, 1917, and 328 shillings quoted the last week in December. Stocks in the London market were small and very little material was being received from the Eastern market. The loss in receipts was so marked that the following table is likely to prove of interest.

Statement of the imports, deliveries, and stocks of shellac in London for the past twelve months, compared with those in the previous year:—

	Imports.		Chests Deliveries.		Stocks.	
Month.	1917.	1916.	1917.	1916.	1917.	1916.
Jan....	416	5,620	5,248	4,938	49,345	94,424
Feb....	56	2,111	3,308	13,566	46,093	82,910
March..	1,155	4,653	4,852	4,394	42,331	83,160
April...	617	5,425	3,285	4,440	39,663	84,145
May....	1,258	8,571	3,526	7,155	37,395	85,561
June....	1,088	7,737	1,994	7,941	36,489	85,357
July....	1,207	3,718	1,786	8,661	35,910	80,414
Aug....	754	1,108	2,194	11,518	34,322	70,004
Sept....	275	955	1,862	6,353	32,735	64,606
Oct.....	339	444	2,925	5,267	30,149	59,848
Nov....	67	1,094	2,432	4,106	27,784	56,761
Dec....	113	830	1,845	3,479	26,052	54,112
Tot., 12 mos.	7,345	42,286	35,257	81,818	....	....

To return to the situation in the United States, the government wisely provided for naval supplies of shellac by sending a transport to the primary market and bringing over adequate quantities of the material. Despite the withdrawal of the Navy Department as a factor in selling, demands grew rapidly. The government found that under the war conditions existing it was necessary to provide for a sufficient supply for the country, but that no surplus stocks be permitted transportation space. Also that the speculative element must be discouraged.

To achieve this result, the War Trade Board presented the United States Shellac Importers' Association, Inc., with a series of guarantees which covered the business from importer to ultimate consumer, and not a pound of the material could be disposed of without guarantees being submitted to the Federal authorities.

At the close of the year this association had taken over the work which had formerly been done by the British consul. Business had been transacted on temporary permits, but shortly after the first of the year the guarantee forms were finally approved by the War Trade Board, and the association took over complete charge of affairs effecting the shellac interests of the country.

Monthly Prices of T. N.

A comparison of monthly prices for T. N. during 1916 and of the high and low limits touched during the previous sixteen years is afforded by the following table, the basis being for bags, cases generally commanding a ½c. premium:—

T. N. IN BAGS.

	1917— High.	Low.
January	40	39
February	47	45
March	57	48
April	57	56
May	62	56
June	60	60
July	55	53
August	57	57
September	57	50
October	48	45
November	59	46
December	60	58
Year	60	39
	High.	Low.
1917	60	39
1916	39	20
1915	21	13½
1914	21	14
1913	23½	16½
1912	16½	13½
1911	18	13½
1910	19½	14
1909	20½	14
1908	29	20
1907	48	26
1906	50	42
1905	46	42
1904	52	42
1903	52¾	26½
1902	40	24
1901	30	14
1900	15	14½

D. C. and V. S. O. Quotations.

The ranges of quotations for D. C.

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		Quinine

and V. S. O. shellac in the local market during the year follow:—

	D. C.		V. S. O.	
	High.	Low.	High.	Low.
January	49	49½	49½	48
February	57	55	56½	54½
March	58	58	57	57½
April	68	67	67	66
May	72	67	71	66
June	72	72	71	71
July	70	70	69	69
August	70	70	69	69
September	70	68	69½	68
October	66	66	66	66
November	65	72	72	64½
December	73	73	73	73
Year	73	49½	73	48

High and Low for Bleached.

The record of high and low prices for bleached shellac by months last year follows:—

	Bone dry.		Commercial.	
	High.	Low.	High.	Low.
January	49	48	41	39½
February	54	57	47	46
March	67	66	55	48
April	67	66	55	54
May	72	66	60	54
June	72	70	58	60
July	68	68	58	56
August	67	67	55	55
September	67	62	55	50
October	62	55	55	45
November	60	55	57	45
December	67	65	57	55
Year	72	48	60	39½

French Olive Oil Market and New Crop Prospects.

A special report from a Reporter correspondent in the olive oil market at Nice, France, gives the following information as to the present (January) condition of the market and the prospects for the new crop year:—

The season of 1916-1917 opened with high prices which were increased from month to month, and with the exceptional rates of freight and of marine and war risk premiums the cost of olive oils reached unprecedented figures, although even at the apex they compared very favorably with the prices prevailing for other food products.

As a matter of fact, owing to the embargo, serious difficulties were faced by the handlers; in the first instance through the short crop, and afterward through the serious and continuous risks incurred in operating a business of such importance. It would have been of financial advantage to many of the larger factors to have closed down their business pending the conclusion of peace terms.

As regards the ensuing season, we are glad to say—our correspondent writes—that on a general average the existing prospects show a distinct improvement over those of last year. The present appearance of the crop is decidedly healthy and the trees show promise of yielding a good crop. The fruit is well matured and shows signs of good quality.

The pressing of the usual standard grades will commence in February, and, weather conditions continuing, there is no reason why favorable results should not be obtained.

"Our experience shows," concludes our correspondent, "even amidst the exceptional difficulties of the past season, that the demand for olive oils is steadily increasing, which is borne out by the fact that our sales in Great Britain have, during 1917, been on a higher scale than in any previous year, and with the increased demand which we anticipate all over, we regret that we are unable to hold out the prospect of prices becoming more favorable, especially when taking into consideration the demand for the higher grades of olive oil which must be supplied from the Nice district, since no real Italian olive oil is available, owing to the embargo of the Italian Government against its exportation."

PEPPERMINT CROP.

Unfavorable Growing and Harvesting Conditions Affected Prices.

The peppermint crop of 1917 was unusually late in most of the growing districts of the States of Michigan and Indiana, but there were large quantities of low-priced old oil held over by dealers, who took advantage of the opportunity and realized a handsome profit from consumers who were in urgent need of supplies.

The peppermint plants were damaged early in the season by high winds and frost, but recovered later and showed a fair growth and a good color. However, exceedingly bad weather prevailed throughout the growing season during August and early in September—very unseasonable and destructive rains and in addition very heavy frosts occurred. For this reason prices advanced sharply and were well maintained until about December when, on account of the scarcity of sugar, the demand for peppermint oil fell off considerably, which brought about a proportionate decline.

Careful investigation reveals the fact that there is now probably enough oil left in the hands of growers, dealers and consumers to supply the legitimate needs, but there is by no means any surplus and even a little improvement in the demand would soon send up prices, because all stocks are now in the hands of financially strong parties who understand the situation and know that the old fields are giving out on account of lack of potash; also that other farm crops are at the present time paying better than peppermint and do not require the extra labor which is now so difficult to obtain.

So it is reasonable to believe that the 1918 acreage will probably be considerably decreased and the yield is expected to be less on account of the lack of potash and the interest manifested in other crops. It is, furthermore, expected that if the war should come to an end there would be an outlet for considerable oil for export, while there is only just about enough oil left to supply our own needs.

Practically the same conditions obtained with regard to spearmint oil.

LONDON BARK AND QUININE MARKET, 1917, NOT GOVERNED BY SUPPLY AND DEMAND

The laws of supply and demand have not, in the year under review, been permitted to govern the bark and quinine markets.

The exports of Java bark which, in spite of general freight difficulties, were larger in 1916 than ever before, with the exception of the year 1913, suddenly ceased almost completely in 1917 and, with only a few million pounds shipped during the whole of the year, first hand stocks in Holland have declined to zero. There was no bark available for distribution under the cinchona agreement in November and December, so that European and American quinine manufacturers now largely depend on their private stocks, the extent of which cannot be estimated; in view of the enormous consumption of quinine it is hardly conceivable that they constitute sufficient raw material for any lengthy period. The bark stocks in Java must naturally be reaching a very large total with which the Bandong factory, despite constant expansion, cannot cope alone. It is reported that Bandong now produces about 125,000-150,000 kilos sulphate of quinine per annum, i. e., quite 20 per cent. of the estimated pre-war annual consumption, amounting to, say, 20,000,000 ounces.

The units fixed for Java barks apportioned to quinine makers during 1917 show hardly any advance over the previous year, thus indicating that quinine sales by first hands have likewise been made at generally unchanged rates. Messrs. Howards have maintained the price of 2s. 6d. per ounce throughout the year. The official quotation in America was, in February, raised from 55c. to 75c. and has since remained unaltered. The Amsterdam Quinine Factory has recently advanced the price for sulphate of quinine from fl. 31 to fl. 41 per kilo. So long as it is expedient and possible to keep the price of Java bark from advancing, the quinine makers lose no money at present official prices. Bandong has distributed a 93 per cent. dividend for 1916, but has probably not made all its sales at its minimum rate.

Production Will Fall Off.

That the acute scarcity of bark in Europe and America must shortly result in a serious falling off in the world's quinine production is fairly evident, and realizing the possibility of a quinine famine the British Government in May assumed control of all quinine stocks in this country, commandeering a large part thereof, mostly at 2s. 6d. per ounce. The official London quinine stock has dwindled to 128,688 ounces, the important arrivals of Dutch and Java quinine being also for the most part requisitioned by the government. The quinine market has in these circumstances been deprived of development on its merits. Sufficient quinine has of course been released for home consumption, which is at all times unimportant enough to leave the market unaffected. The quantities allowed for exportation have been getting over smaller and very few permits are now issued, whatever the destination. The incomparably strong statistical position of bark and quinine has, in spite of all, gradually advanced the price in the very small open market to 3s. 3d. in London, and to about 90c. in New York.

Non-quinine producing countries have, in recognition of the statistical situation and the severe export restrictions prevailing in producing countries, paid high prices for the article during 1917 and remain eager buyers.

Java Bark.

Arrivals of Java bark in the United Kingdom during 1917 amounted to 7,425 packages. (Only 39 packages were offered in auction, none being sold.) Some of this bark has no doubt been apportioned to British quinine makers under the cinchona agreement; the bulk has probably found its way to Holland for the use of other signatories to that agreement. There are no direct steamers from Java to Holland, but the conveyance of certain quantities of bark to Amsterdam via the United Kingdom appears to have been sanctioned by the authorities. What arrangements, if any, are on foot for further shipments of Java bark to the United Kingdom is not known. Quinine makers have hitherto refrained from acquiring more than retail quantities of other barks available in this country, notably of calisaya bark, of which the present stock amounts to about 3,000 packages. The exportation of cinchona bark to all destinations was prohibited in May last, bringing all business in cinchona bark practically to a standstill. From the moment of threatening serious scarcity of Java bark importers had given their South American friends the most liberal financial assistance towards a continuance and increase of their consignments to the United Kingdom. These consignments have been made, and financed on the basis of prices obtainable before the reinforcement of the export prohibition. Export (druggists') orders at adequate prices are plentiful, their execution impossible, the barks therefore practically unsalable and the flow of consignments to London arrested.

The cost of gathering calisaya bark in South America and of its translation to this market renders all competition with the artificially low prices of Java manufacturing barks utterly impossible. As a druggists' bark, calisaya quills have nearly always commanded a considerable premium over the Java manufacturing varieties.

No auctions of quinine have taken place in Amsterdam.

India Production.

Quinine production in India has apparently maintained the previous level, with consumption somewhat higher, partly owing to army supplies sent to Mesopotamia. We append our usual figures:—

	Half kilos (about)
Java shipments according to cabled figures, 1917	3,135,000
Java shipments according to cabled figures, 1916	17,153,000
Java shipments according to cabled figures, 1915	11,222,000

Imports of bark into the United Kingdom:—

	1917.	1916.	1915.
Indian	634	4,526	1,400
Ceylon	....	6	20
Java	7,425	1,349	4,132
African	....	841	211
Calisaya	3,841	4,219	925
Totals	11,900	10,941	6,688

The amounts of sulphate of quinine in the bark disposed of during the last three years by auction and private distribution are:—

	Kilos		
	1917.	1916.	1915.
Amsterdam	421,772	481,510	412,001
London	4,874	10,888	3,630
Totals	426,646	492,398	415,631

Amsterdam Data.

The average analyses of Java manufacturing barks, catalogued at Amsterdam, and average unit prices obtained for the past three years are as follows:—

	1917.	1916.	1915.
Analyses	....	6.17%	6.25%
Units	*11.65	11.40c.	6.20c.

* About.

Stocks of bark December 31:—

	Packages		
	1917.	1916.	1915.
Amsterdam	2,072	47,303	49,080
London	7,115	5,912	4,680

Stock of quinine sulphate in London according to Port of London Authority's returns:—

December 31—	Ounces.
1917	128,688
1916	1,226,120
1915	1,555,616

The fluctuations of bark and quinine prices during 1917 are given in the following table:—

	Unit—		Sulphate of quinine—					
	Amsterdam.	London.	Howard's.	Second hands.				
	Cents.	d.	s.	d.	s.	d.	s.	d.
January	10.73	...	2	6	2	2@	2	4½
February	11.81	2¼	2	6	2	8@	0	0
March	11.83	2½	2	6	2	8½@	0	0
April	...	2½	2	6	2	8@	0	0
May	11.45	...	2	6	2	8@	0	0
June	11.59	3½	2	6	2	8@	0	0
July	11.70	3½	2	6	2	9@	0	0
August	11.46	2½	2	6	2	11@	0	0
September	...	...	2	6	2	11@	0	0
October	11.37	2½	2	6	2	11@	3	2
November	...	...	2	6	3	3@	0	0
December	...	...	2	6	3	3@	0	0

SECOND-HAND QUININE.

	Open.		Close	
	s.	d.	s.	d.
1917	2	2	3	3
1916	3	6	2	8
1915	1	1½	3	6
1914	1	0	1	1¼
1913	0	9½	1	0
1912	0	7½	0	9
1911	0	6½	0	7¼
1910	0	7⅛	0	6½
1909	0	7	0	7
1908	0	7⅝	0	7¼

Ceylon Shipments.

The shipments of bark from Ceylon were:—

October 1—	Pounds.
1916-1917	....
1915-1916	900
1914-1915	2,600
1913-1914	12,980
1912-1913	32,367
1911-1912	131,571
1910-1911	74,962
1909-1910	109,381
1908-1909	149,796
1907-1908	168,526

Java Shipments.

The shipments of bark from Java were:—

October 1—	Half kilos.
1916-1917	6,818,600
1915-1916	17,634,541
1914-1915	11,309,491
1913-1914	16,153,234
1912-1913	18,118,186
1911-1912	17,146,933
1910-1911	17,011,386
1909-1910	18,640,368
1908-1909	15,900,141
1907-1908	16,067,153

Arrivals in U. K.

The arrivals of bark in the United Kingdom were:—

	Calisaya. Pkgs.	Other South American bark. Pkgs.	East India, Java and Africa. Pkgs.
1917	3,841	....	8,059
1916	4,219	....	6,722
1915	925	....	5,763
1914	...	....	5,881
1913	...	....	3,420
1912	109	....	6,001
1911	...	....	6,030
1910	949	....	4,317
1909	884	....	4,255
1908	319	....	3,138

Total arrivals in United Kingdom:—

	Packages.
1917	11,900
1916	10,941
1915	6,688
1914	5,881
1913	3,420
1912	6,110
1911	6,030
1910	5,266
1909	5,139
1908	3,462

United Kingdom consumption and reshipments:—

	Packages.
1917	10,607
1916	9,709
1915	6,125
1914	5,109
1913	4,655
1912	5,785
1911	6,439
1910	5,050
1909	4,534
1908	3,660

London Stocks.

Stocks in London on December 31:—

	Packages.
1917	7,115
1916	5,912
1915	4,680
1914	4,117
1913	3,345
1912	4,590
1911	4,255
1910	4,664
1909	4,448
1908	3,843

LONDON DRUG AND MEDICINAL CHEMICAL MARKET VALUE UPLIFT IN 1917

In the following tables the course of values in the crude drug and medicinal chemical sections of the London market are traced. The crucial points in time taken being about the beginning and end of the year and the close of the intermediate quarters. The crude drug section shows some very distinct accessions to values, owing to the shipping difficulties in bringing fresh supplies in, and also to the fact that some of the articles are mainly of enemy production. Some articles not listed have been of such occasional sale, through scarcity, that comparison is not permissible. It may be mentioned, however, that "color" drugs have fetched very long prices, e. g., gamboge, good blocky Siam of which realized £31 per cwt. in February and £35 in September, while good Zanzibar dragon's blood drop fetched £13 in February and £11 in December.

	Jan.			March			June			Sept.			Dec.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Aconite root, Japan, cwt.	0	50	0	0	50	0	0	60	0	0	60	0	0	60	0
Aloes, good, hard, bright	0	40	0	0	40	0	0	53	0	0	53	0	0	60	0
Balsam, copaiba, B. P., lb.	0	3	9	0	4	6	0	5	0	0	5	0	0	5	0
Balsam, Peru	0	14	3	0	15	9	0	15	6	0	19	0	0	19	0
Balsam, tolu	0	1	8	0	1	10	0	2	6	0	2	6	0	4	6
Belladonna root, lb.	0	6	6	0	8	9	nominal.			0	6	6	0	6	6
Cantharides, Russian, lb.	0	15	3	0	19	0	0	20	0	0	18	6	0	18	0
Cascara sagrada, 2-year old, cwt.	0	100	0	0	100	0	0	105	0	0	105	0	0	110	0
Chamomiles, cwt.	nominal.			nominal.			0	440	0	0	360	0	0	350	0
Colchicum root, lb.	0	4	9	0	6	0	0	7	0	0	8	0	0	8	6
Cubebs, cwt.	15	0	0	16	0	0	17	10	0	0	0	0	25	0	0
Ergot of rye, Russian, lb.	0	1	9	0	1	9	0	2	0	0	2	2	0	2	5
Galls, China, plums, cwt.	0	90	0	0	95	0	0	110	0	0	135	0	0	140	0
Gentian root, cwt.	0	75	0	0	70	0	0	77	6	0	85	0	0	80	0
Guaiacum ord., glossy, lb.	0	0	8	0	0	9	0	0	0		*		0	0	0
Insect flowers, Japan, cwt.	0	155	0	0	155	0	0	170	0	0	165	0	0	165	0
Ipecac, fair, Cart., lb.	0	9	0	0	10	6	0	9	9	0	9	9	0	11	0
Ipecac, Rio, lb.	0	10	0	0	10	0	0	9	9	0	11	0	0	12	0
Kola nuts, fair, W. Ind'a, lb.	0	0	5½	0	0	5½	0	0	6	0	0	7½	0	0	8¼
Licorice root, Span., cwt.	0	97	6	0	100	0	0	102	6	0	110	0	0	125	0
Opium, Pers., 10 p. c., lb.	0	36	0	0	36	0	0	42	0	0	60	0	0	60	0
Sarsaparilla, Jam., gray, lb.	0	1	10	0	0	0	0	0	0	0	3	9		‡	
Senega root, lb.	0	3	3	0	3	3	0	3	6	0	4	0	0	4	4
Senna, Tinnevelly, med. green, lb.	0	0	5	0	0	5½	0	0	5¾	0	0	6	0	0	6
Valerian root, cwt.	0	135	0	0	155	0	0	175	0	0	200	0	0	300	0
Wax, bees', Jamaica, cwt.	8	12	6	9	17	6	11	10	0	11	15	0	11	15	0

* Fine glossy block, 4s. 6d. per lb.

‡ Sea damaged, sold December auction at £1 3s. 5d.

Synthetic Chemicals.

Taking some of the fine chemicals, the so-called synthetic group naturally attracts first attention by reason of their former enemy origin and the known efforts to make some of them here and in the other Allied countries. In this connection declines in guaiacol carbonate phenacetine phenazone phenolphthelein and resorcin are significant of rather more plentiful supplies. Hexamine is being considerably made in the country, but the demand for war purposes is very large.

The following comparison of seed prices on spot is interesting:—

	January.			March.			June.			September.			December.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Canary seed, gr.	0	80	0	0	80	0	0	87	0	0	95	0	0	131	0
Celery seed, cwt.	0	100	0	0	100	0	0	120	0	0	127	0	nominal.		
Coriander seed, cwt.	0	57	6	0	75	0	0	75	0	0	65	0	0	82	6
Cummin seed, cwt.	0	87	6	0	85	0	0	80	0	0	67	6	0	67	6
Dill seed, cwt.	0	25	0	0	37	6	0	50	0	0	56	0	0	62	6
Fenugreek seed	0	34	0	0	52	6	0	52	6	0	56	0	0	58	0
Mustard seed, cwt.	0	53	0	0	39	0	0	39	0	0	42	0	0	47	6

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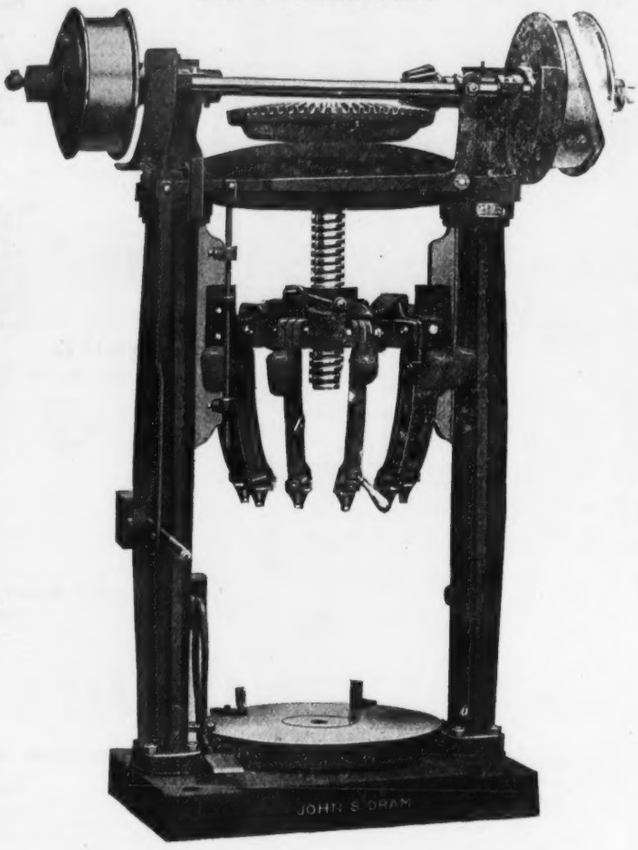

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	Jan.			March			June			Sept.			Dec.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Acetanilide	0	2	8	0	3	0	0	3	0	0	2	10	0	4	0
Aceboralicylic acid	0	17	0	0	15	6	0	14	0	0	15	0	0	14	0
Amidopyrin	0	55	0	0	65	0	0	70	0	0	70	0	0	72	0
Barlitone	0	115	0	0	135	0	0	110	0	0	115	0	0	125	0
Betanaphthol	0	10	0	0	11	0	0	11	0	0	8	6	0	7	0
Chloral hydrate, d. p.	0	8	9	0	9	0	0	9	6	0	10	3	0	11	0
Guaiacol carbonate	0	110	0	0	100	0	0	140	0	0	130	0	0	127	6
Hexamine	0	9	9	0	3	0	0	3	9	0	3	8	0	5	0
Hydroquinone	0	10	6	0	11	6	0	12	6	0	11	0	0	11	6
Methyl salicylate	0	5	3	0	5	3	0	5	6	0	5	0	0	4	9
Methyl sulphonol	0	60	0	0	57	6	0	60	0	0	57	6	0	57	6
Paraldehyde	0	10	0	0	12	6	0	13	0	0	14	0	0	15	6
Phenacetin	0	90	0	0	80	0	0	90	0	0	75	0	0	45	0
Phenazone	0	38	0	0	52	6	0	60	0	0	56	0	0	56	0
Phenolphthalein	0	90	0	0	85	0	0	92	6	0	85	0	0	55	0
Pyrogallic acid	0	15	0	0	15	0	0	17	0	0	17	6	0	17	6
Resorcin	0	140	0	0	130	0	0	85	0	0	72	6	0	54	0
Salicin	0	20	0	0	25	0	0	25	0	0	25	0	0	30	0
Salicylic acid	0	4	6	0	4	0	0	6	0	0	7	6	0	6	3
Saccharin, 550	0	240	0	0	200	0	0	310	0	0	360	0	0	330	0
Sodium salicylate	0	5	9	0	5	0	0	7	6	0	9	6	0	7	0
Sulphonal	0	30	0	0	40	0	0	45	0	0	40	0	0	45	0
Terpineol	0	2	6	0	2	6	0	2	6	0	2	8	0	2	9

The Alkaloids.

The alkaloidal group, which is more closely identified with British production, shows the following movements:—

	Jan.			March			June			Sept.			Dec.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Atropine sulph, oz.	0	110	0	0	110	0	0	110	0	0	125	0	0	120	0
Caffeine, pure, cryst., makers', lb.	0	40	0	0	40	0	0	40	0	0	40	0	0	50	0
Caffeine, second hands	0	47	6	0	50	0	0	50	0	0	50	0	0	65	0
Cocaine, hydrochlor, oz.	0	25	0	0	30	0	0	27	0	0	36	0	0	48	0
Codeine, pure crystals, oz.	0	21	0	0	21	0	0	22	0	0	25	0	0	30	0
Emetine, pure, grm.	0	5	9	0	5	3	0	5	3	0	5	3	0	5	3
Eserine, grm.	0	7	0	0	7	0	0	7	0	0	7	0	0	7	6
Morphine, hydrochlor, oz.	0	14	0	0	13	6	0	13	6	0	13	6	0	13	6
Pilocarpine, hydrochlor, oz.	0	24	0	0	24	0	0	24	6	0	27	0	0	27	0
Quinine, sulphate, oz.	0	2	4	0	2	8	0	2	8	0	2	10	0	3	5
Strychnine, pure, cryst., oz.	0	3	4	0	3	6	0	3	11	0	3	11	0	4	6
Theobromine, lb.	0	80	0	0	80	0	0	80	0	0	80	0	0	70	0

Other Articles.

To the foregoing values of other articles more or less associated with British factories may be added in summary:—

	Jan.			March			June			Sept.			Dec.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Bromides, amon., lb.	0	5	0	0	4	3	0	4	3	0	3	9	0	5	0
Bromides, potass.	0	6	6	0	5	0	0	6	3	0	6	3	0	6	9
Bromides, soda	0	4	0	0	2	9	0	2	6	0	2	8	0	3	0
Bismuth, carb., lb.	0	12	0	0	12	0	0	12	0	0	12	0	0	12	6
Bismuth, subnit., lb.	0	10	10	0	10	10	0	10	10	0	10	10	0	11	4
Camphor, cwt.—															
Japan, B c. i. f.	0	184	6	0	180	0	0	180	0	0	202	0	0	202	0
Japan, BB c. i. f.	0	174	6	0	190	0	0	190	0	0	210	0	0	210	0
Japan, 1-oz. slabs	0	3	8	0	3	9	0	3/6-3/9		0	4	2	0	4	3
Japan, 2½-lb. slabs	0	3	6	0	3	9	0	3	3	0	3	7	0	3	9
English bells	0	2	11	0	3	4	0	3	4	0	3	8	0	3	8
English flowers	0	2	10	0	3	3	0	3	3	0	3	7	0	3	7
Citrate, potass.	0	3	11	0	3	11	0	3	11	0	3	11	0	3	11
Citrate, soda	0	2	8	0	2	9	0	2	9	0	2	9	0	2	9
Epsom salts, medic., cwt.	0	14	0	0	16	6	0	24	0	0	24	0	0	26	0
Ferri et ammon. cit., lb.	0	12	8	0	2	9	0	2	9	0	2	9	0	2	9
Ferri quin. cit., oz.	0	1	0	0	1	0	0	1	0	0	1	0	0	1	0
Hypophosphites, calcium, lb.	0	2	9	0	2	9	0	2	9	0	2	11	0	2	11
Hypophosphites, potass.	0	4	5	0	4	5	0	4	5	0	4	8	0	4	8
Hypophosphites, sodium	0	3	0	0	3	0	0	3	0	0	3	2	0	3	2
Iodine, crude, oz.	0	0	10	0	0	8½	0	0	8½	0	0	8½	0	0	10½
Iodine, remb., lb.	0	17	3	0	13	8	0	13	8	0	13	8	0	*16	4
Iodoform, lb.	0	19	2	0	16	4	0	16	4	0	16	4	0	*19	2
Iodide, potassium, lb.	0	15	0	0	11	7	0	11	7	0	11	7	0	*13	10
Phosphoric acid (1.50), lb.	0	1	1	0	1	3	0	1	3	0	1	3	0	1	3
Sulphocarbolate, zinc. soda	0	3	3	0	3	3	0	3	3	0	3	3	0	3	0

*Net.

Other Variations.

And, in conclusion, variations in drugs and allied articles of more general source may be listed, the changes in this, as in the tables above, reflecting the operations of supply and demand:—

	Jan.			March			June			Sept.			Dec.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Acetic acid, glac., lb.	0	1	11	Nominal			0	2	9	0	2	9	0	3	3
Almond oil (sweet), lb.	0	2	6	0	2	8	0	2	8	0	2	9	0	2	11
Castor oil, firsts, cwt.	0	70	0	0	72	0	..	..	..	0	88	0	0	88	0
Cocoa butter, Eng., lb.	0	1	7	0	1	8	0	1	5	0	1	2½	0	1	5
Glucose liquid, cwt.	0	36	0	..	..	..	0	55	0	0	47	0	0	60	0
Hydrobromic acid, P. P., lb.	0	0	11	0	0	11	0	0	11	0	0	11	0	0	11
Ether meth., 0.720, lb.	0	1	10½	0	2	1	0	2	1	0	2	1	0	2	1
Lime juice from W. I., gal.	0	2	9	0	2	9	0	2	3	0	3	0	0	3	0
Lithium carbonate, lb.	0	5	0	0	5	0	0	5	0	0	5	3	0	6	9
Lycopodium, lb.	0	4	4	0	4	3	0	4	8	0	5	6	0	6	0
Milk sugar, cwt.	0	180	0	0	185	0	0	210	0	0	250	0	0	280	0
Olive oil, Span., cwt.	0	70	0	Nominal			0	14@16 0 (gal.)		0	17	0	0	22	6
											(gal.)				
Peach kernel oil, lb.	0	1	3	0	1	3	0	1	3	0	1	3	0	1	8
Santonin, lb.	0	160	0	0	155	0	0	155	0	0	155	0	0	170	0
Tannic acid, lb.	0	4	10	0	5	0	0	6	3	0	6	6	0	7	9
Thymol, lb.	0	30	0	0	32	6	0	40	0	0	45	0	0	45	0
Zinc sulph., pure, cwt.	0	35	0	0	35	0	0	35	0	0	40	0	0	40	0

LONDON ESSENTIAL OIL AND PERFUMERY CHEMICAL MARKET IN 1917

Marked falling off in fresh supplies, through the stringency in shipping, was mainly responsible for the general uplift in values shown in the accompanying tables. True, in a few articles government restrictions on consuming industries caused demand to fall off—lemon oil, for instance—but the general effect of the obvious curtailment in arrivals was to stimulate orders, all round users wisely fortifying themselves against a possible future stoppage of offers almost entirely. So that a sustained demand accentuated the price elevations normal to declining receipts and high freights. Besides the foregoing, other factors have operated in particular oils, as in the case of the Chinese oils, which were affected by a rise in silver; of olive oil through the remarkable advance in the cost of the spice; of caraway oil, from the shortage and speculation in the seed; of clove leaf oil, through the run on it when clove oil got so short; of cubeb oil, through the high price of the berries; of Bourbon geranium oil, through (to some extent) the supplanting of geranium by sugar cultivation in the island; of neroli oil, resulting from a smaller yield of the new French crop; of concrete orris oil, through a falling off in production; of peppermint oil, from causes better known on your side than this; and of otto of rose, through the impossibility of getting further supplies of Bulgarian.

In connection with the latter, a fine opportunity for the French otto to establish itself has been fully taken advantage of, and this particular distillate appears to have permanently taken the place of the "enemy" production in many perfumery formulæ. Another outstanding point has been a demonstration of the earnestness of the Indian Government authorities in their sandalwood oil distillation; a regular market organization has been established, and it is understood the results encourage the advisers back of the movement in their schemes of larger production.

The depression in lemon oil led the various proposals for the relief of the large stocks in Sicily, and toward the close of the year an Italian Government decree was promulgated which appeared to aim at a restriction on future output. Bergamot has not been so bad a market, a fairly good demand maintaining prices, notwithstanding somewhat heavy stocks.

A special difficulty of the manufacturing perfumery trade arose from the government cutting off the ordinary spirit supplies. To overcome this the perfumers co-operated with distilling interests in the rectification of certain qualities of rum.

In the following table spot prices are shown toward the beginning and end of the year, and at the close of the intermediate quarters (per pound unless otherwise stated):—

	Jan.			March			June			Sept.			Dec.		
Oil.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Almond	0	42	6	0	45	0	0	45	0	0	45	0	0	45 0@0	50 0
Anise	0	3	5½	0	3	5½	0	3	4½	0	4	2	0	4 3@0	4 6
Bergamot	0	21	0	0	19	0	0	20	0	0	20	0	0	21	0
Bois de Rose	0	13	6	0	14	6	0	15	0	0	16	6	0	16	0
Cajeput	0	3	9	0	4	0	0	4	0	0	3	9	0	4	3
Camphor (white), cwt.	0	70	0	0	75	0	0	90	0	0	95	0	0	100	0
Caraway (double rect.)	0	15	6	0	16	0	0	18	6	0	21	0	0	21	0
Cassia (80-85 ca.)	0	4	8	0	4	4	0	4	4	0	5	6	0	6	3
Cinnamon leaf, African, oz.	0	0	3½	0	.	4	0	0	4	0	0	6	0	0	6
Ceylon, oz.	0	0	5	0	0	6	0	0	6	0	0	7	0	0	8
Citronella, Ceylon	0	1	10	0	1	9	0	1	9	0	2	2	0	2	5
Clove oil, English	0	5	10	0	5	10	0	7	4	0	11	3	0	17 0@0	18 0
Clove leaf	0	4	6	0	5	0	0	5	6	0	6	6		none.	
Coriander	0	43	0	0	40	0	0	55	0	0	70	0	0	70	0
Cubeb	0	20	0	0	27	6	0	30	0	0	32	6	0	35	0
Eucalyptus, B. P.	0	2	4½	0	2	4½	0	2	4¼	0	2	9	0	3	0
Geranium, Bourbon	0	12	0	0	14	0	0	14	6	0	21	0	0	21	6
Algerian	0	13	6	0	15	0	0	15	0	0	19	0	0	22	6
French	0	29	0	0	29	6	0	36	0	0	38	0	0	40	0
Juniper berry	0	50	0	0	55	0	0	47	6	0	45	6	0	47	0
Lavender, French	0	17	0	0	17	0	0	18	0	0	17	6	0	18	0
Lavender spike, Spanish	0	4	0	0	3	6	0	3	6	0	3	9	0	4	6
French	0	4	6	0	4	6	0	4	9	0	5	6	0	5	9
Lemon oil, spot	0	4	0	0	4	0	0	4	0	0	4	0	0	4	3
Lemongrass	0	2	2¾	0	2	3½	0	3	3¼	0	3	5½	0	3	5½
Lime oil, distilled	0	9	0	0	8	0	0	8	6	0	7	6	0	8	0
hard pressed	0	14	0	0	15	0	0	16	0	0	16	0	0	20	0
Neroli, fair quality	0	6	0	0	10	0	0	17	6	0	18	0	0	18	0
Nutmeg	0	6	0	0	7	0	0	7	6	0	8	0	0	8	0
Orange, spot	0	11	3	0	10	6	0	10	6	0	10	6	0	10	6
Origanum	0	7	6	0	8	0	0	8	0	0	8	0	0	9	0
Orris, concrete, oz.	0	17	6	0	22	0	0	23	0	0	26	0	0	42	0
liquid, lb.	0	58	0	0	58	0	0	60	0	0	60	0	0	60	0
Palmarosa	0	12	0	0	12	0	0	12	6	0	14	0	0	16	0
Patchouli	0	70	0	0	80	0	0	80	0	0	95	0	0	120	0
Pennyroyal	0	6	6	0	6	6	0	6	6	0	7	0	0	7	6
Peppermint, Amer., bulk	0	10	3	0	11	0	0	11	0	0	16	0	0	17	6
H. G. H.	0	14	0	0	15	0	0	16	6	0	20	6	0	22	6
Jap. dementh., Kob	0	4	1½	0	3	6	0	3	6	0	3	8	0	3	9
Petitgrain, Paraguay	0	12	0	0	13	6	0	12	6	0	13	6	0	13	6
French	0	28	0	0	28	0	0	28	6	0	28	0	0	28	6
Otto of Rose, Bulg., oz.	0	80	0	0	85	0	0	95	0	0	97	6	0	100	0
French	0	50	0	0	58	0	0	70	0	0	70	0	0	75	0
Rosemary, Spanish	0	2	2	0	2	0	0	2	0	0	2	3	0	2	6
Sandalwood	0	47	6	0	50	0	0	52	6	0	52	6	0	52	6
Sassafras	0	3	5	0	3	5	0	3	10	0	4	9	0	6	0
Spearmint	0	8	0	0	8	9	0	8	6	0	15	0	none.		
Thyme oil, French red	0	5	6	0	5	9	0	6	0	0	7	0	0	8	0
French white	0	6	0	0	6	3	0	6	0	0	7	0	0	8	0
Vetivert, Bourbon	0	34	0	0	37	0	0	38	0	0	50	0	0	50	0
Java	0	72	0	0	75	0	0	75	0	0	100	0	0	102	6
Wormseed	0	15	6	0	19	0	0	25	0	0	33	0	0	42	6

Synthetic Chemicals.

In the synthetic chemical department it is difficult to be specific as to value, owing to sellers' varying ideas, but the following may be taken as indicative of prices at about the commencement and termination of the year and at the end of the intervening quarters. The whole shows a general rise, and especially outstanding is the great advance in the cost of vanillin, coumarin and bromstyrol. Benzaldehyde and methyl salicylate are practically the only instances of cheapening:—

	Jan.			March			June			Sept.			Dec.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
Amyl salicylate	0	12	0	0	15	0	0	15	0	0	14	0	0	15	0
Aubepine	0	32	0	0	32	0	0	35	0	0	60	0	0	60	0
Benzaldehyde	0	25	0	0	25	0	0	20	0	0	22	0	0	20	0
Benzyl, acetate	0	26	0	0	25	0	0	25	0	0	35	0	0	25	0
benzoate	0	24	0	0	30	0	0	32	0	0	35	0	0	35	0
Bromstyrol	0	40	0	0	50	0	0	50	0	0	80	0	0	85	0
Citronellol	0	35	0	0	36	0	0	36	0	0	36	0	0	37	6
Coumarin	0	55	0	0	57	6	0	72	6	0	95	0	0	155	0
Heliotropin	0	27	0	0	28	0	0	28	0	0	31	0	0	31	0
Isoengenol	0	26	0	0	16	0	0	18	0	0	26	0	0	45	0
Musk, xyiol	0	38	0	0	43	0	0	50	0	0	70	0	0	75	0
Methyl anthranilate	0	30	0	0	34	0	nominal.			0	100	0	0	120	0
salicylate	0	5	6	0	5	0	0	5	6	0	5	0	0	4	9
Neroline	0	12	0	0	13	0	0	13	0	0	14	0	0	15	0
Phenyl ethyl alcohol	0	100	0	0	100	0	0	130	0	0	140	0	0	140	0
Phenyl ethyl aldehyde	0	27	6	0	120	0	0	120	0	0	140	0	0	160	0
Safrol	0	2	4	0	2	4	0	2	5	0	2	5	0	2	5
Terpineol	0	2	6	0	2	3	0	2	6	0	2	8	0	3	0
Vanillin	0	27	0	0	26	6	0	38	0	0	45	0	0	60	0

Necrological Record for the Year 1917.

The year 1917 has been marked by the deaths of a number of men prominent in the trades and industries represented by the Reporter. Sketches of the lives and business careers of the men who have passed over the Great Divide were published in the Reporter at the time, and in the following table the name, date of death, age and date of issue of the Reporter in which the obituaries appeared are given in the order named:—

Name—Date of death.	Age.	Date of publication.
Allison, Col. Jo W., May 21	69	May 28
Alpers, Dr. William C., Feb. 20	68	Feb. 26
Ansbacher, Adolph B., Feb. 19	86	Feb. 26
Armstrong, John S., June 17	..	June 25
Bagot, Thomas R., Dec. 30, 1916.	..	Jan. 5
Barker, Robert, March 20	77	Mar. 26
Barnsdall, Theodore N., Feb. 27	66	Mar. 5
Bartlett, Nicholas Gray, Jan. 4	77	Jan. 8
Bartlett, William J., June 27	..	July 9
Beers, Henry Irving, week Feb. 26	87	Mar. 5
Berry, Thomas, May 24	88	May 28
Bielenburg, Albertus, Dec. 25	61	Dec. 31
Boyer, J. A., week of Nov. 12	81	Nov. 19
Brewer, E. Avery, week July 16	63	July23-30
Bucklen, Herbert E ,Jan. 10	69	Jan. 15
Bush, Alfred John, July 31	22	Aug. 27
Calisher, Aaron B., Dec. 10	60	Dec. 17
Calvert, C. P., Jan. 26	73	Jan. 29
Camp, Harry E., Sept. 27	33	Oct. 8
Carroll, Walter, week of Dec. 24	..	Jan. 8
Carter, Col. John J., Jan. 3	..	Jan. 8
Caspari, Prof. Chas., Jr., Oct. 13	67	Oct. 22
Childs, R. H., week of Aug. 19	71	Aug. 27
Clapp, Milo Spencer, April 9	81	April 16
Coffin, Gorham B., Dec. 23, 1916.	76	Jan. 1
Congdon, Edmond D., April 14	65	April 16
Cook, Nehemiah B., Jan. 30	88	Feb. 5
Cuddy, Loftus, Aug. 24	65	Sept. 8
Dannatt, Thos. Richard, Jan. 24	63	Jan. 29
De Vilbiss, Allen, M. D., Oct. 1	76	Oct. 15
Diehl, C. Lewis, March 25	76	April 2
Dimmick, George H., week Dec. 17	78	Dec. 24
Edwards, Edmund P., Feb. 2	87	Feb. 5
Emery, E. M., week Dec. 10	63	Dec. 17
Everest, Charles Marvin, July 22	65	July 30
Everson, Corydon, week Sept. 24	82	Oct. 1
Ferguson, Elbert C., June 8	61	June 18
Fergueson, John, Nov. 3	73	Dec. 3
Fox, Albert M., Nov. 14	..	Nov. 26
Fox, Maskell E., Jan. 22	..	Feb. 5
Fritsche, Ernst F., Dec. 21, '16.	66	Jan. 1
Galloway, John, week May 21	77	May 28
Graffiin, William H., July 7	69	July 16
Hazard, Fred. Rowland, Feb. 27	59	Mar. 5
Herrfeldt, H. P., Feb. 18	..	April 2
Hobby, Lewis H. Feb. 16	75	Feb. 26
Holden, A. Edward, Oct. 20	57	Dec. 3
Holzhauer, Charles, Nov. 19	70	Nov. 26
Homer, Charles S., Aug. 27	83	Sept. 10
Isley, William C., Nov. 21	62	Nov. 26
Jennings, T. Albert, Aug. 16	..	Sept. 8
Jordan, Francis 3d, week Nov. 19	25	Nov. 26
Lambert, Jordan W., Aug. 7	43	Aug. 13
Libby, William H., Jan. 25	72	Jan. 29
Link, David C., Sept. 23	62	Oct. 1
McBride, William C., May 21	..	May 28
McDonagh, William, June 28	44	July 2
Main, Thomas F., April 27	68	April 30
Marchand, Charles, Jan. 16	..	Jan. 22
Marsh, William N., May 8	62	May 21
Marvin, Henry E., Sept. 29	..	Oct. 8
Mather, H. C., week July 2	48	July 9
Matson, William, week Oct. 8	68	Oct. 15
Mean, Henry Olmstead, April 15	71	April 23
Meek, Richard L., July 5	72	July 16
Milton, Leander, Dec. 18	73	Dec. 24
Moore, Benjamin, Sept. 30	63	Oct. 8
Murphy, Michael, March 3	76	Mar. 12
Muth, John S., August 31	51	Sept. 3
Nassau, James, March 8	..	Mar. 12
Neidlinger, Philip, Nov.	..	Dec. 10
Nichols, Charles C., June 13	70	June 18
Olcott, George M., Sept. 14	82	Sept. 17
Parsons, Schuyler L., Nov. 4	65	Nov. 19
Patterson, Robt. W., Oct. 23	79	Oct. 29
Payne, Col. Oliver H., June 27	79	July 2
Pinck, William H., March 27	57	April 2
Piper, George F., Dec. 1	61	Dec. 10
Porter, George, April 23	73	April 30
Pulsifer, Walter H., week Aug. 19	44	Aug. 27
Rising, Edward H., Oct. 3	69	Oct. 8
Robinson, W. A., May 9	74	May 14
Rockefeller, Frank, April 15	72	April 23
Roeher, Eugene T., Oct. 17	50	Oct. 22
Savage, J. S., week June 11	..	June 18
Schlotterbeck, Julius O., June 1	52	June 4
Schweitzer, Dr. Hugo, Dec. 22	56	Dec. 31
Scofield, D G., July 30	..	Aug. 6
Scofield, Joseph W., Jan. 21	65	Jan. 29
Scrafford, H. L., May 31	52	June 11
Searle, G D., January 25	71	Feb. 5
Shaw, Horace Gray, June 20	78	June 25
Shrakley, James, Dec. 10	88	Dec. 17
Silk, Michael, week July 23	74	July 30
Smith, Levi, week May 7	70	May 14
Smith, Ralph Harvey, May 25	..	June 4
Stoddard, George S., Feb. 1	61	Feb. 12
Swan, Alden S., Feb. 23	79	Feb. 26
Tanner, William E., Aug. 19	49	Aug. 27
Thacher, George, Aug. 8	..	Aug. 13
Thompson, A D., week Dec. 24,16	56	Jan. 1
Thompson, George, Nov. 15	54	Nov. 19
Tiemann, Daniel F., April 6	71	April 9
Tupper, Benjamin S., April 2	85	April 9
Tyler, C. E., Nov. 23	83	Dec. 8
Upjohn, Fredk. L., Dec. 1	60	Dec. 10
Wainwright, Jos. R., week July 9	75	July 16
Weingartner

A Solution of the High Cost of Linseed Oil

March, 1917, about a year ago we advertised in this journal, *Union Film Oil*—a substitute for Linseed Oil. It was our intention to continue our advertising indefinitely, but so great was the demand, that it far exceeded our capacity.

***Union Film Oil* made good—that is the whole story. It is the only substitute for Linseed Oil that mixes perfectly with all pigments—will not curdle with white lead—works evenly and freely and dries to a hard elastic film.**

Union Film Oil

A Substitute for Linseed Oil

is a synthetic paint oil that is scientifically prepared in two grades—raw and boiled. Closely resembles Linseed as to gravity, viscosity and color. Its spreading qualities are in every respect equal to Linseed, and the ultimate results define satisfaction in the broadest sense of the word.

There is no deception practiced in using *Union Film Oil*—no need to make any excuses or sacrifice quality because *Union Film Oil* satisfactorily and conclusively produces the same results as the genuine Linseed Oil. Remember it's not what you think, but the facts that count—we have the proof—we are willing to "show you." Ask for sample and explanatory literature.

Union Petroleum Company

Philadelphia, Pa. Kansas City, Mo. Chicago, Ill.

REMARKABLE INCREASE IN CRUDE OIL PRODUCTION IN 1917 UNDER PARTICULARLY TRYING CONDITIONS IN THE FIELDS

In Round Numbers 326,300,000 Barrels of Oil Were Put Into Consumption in 1917, as Against 306,297,760 Last Year, and 298,137,631 in 1915—Scarcity of Materials and Lack of Transportation Facilities a Hampering Influence.

NO study of the petroleum markets of the United States during the year 1917 can be made without stating at the outset that the result in new production was obtained under the most adverse circumstances ever recorded in the history of this industry.

From the very outset the demands of the combatants abroad—German, of course, excepted—were such that the outgo of petroleum and its products was so great that consequent conservation of consumption domestically resulted. Under the circumstances the fact that the prices of both crude and the refined products did not exceed the quotations at the close of the year is to the credit of producer, refiner and distributer alike.

Soon after the United States entered the war, with the almost immediate increased demand for petroleum products there was talk of federal control of the petroleum industry, and some federal officials went so far as to state that fixation of prices and government operation of both refineries and wells could be looked for as a natural sequence. The attitude of the oil men themselves, and their consistent and persistent endeavor to put into consumption the largest possible amounts of both crude and refined petroleum, was, however, soon recognized by the government, and the result was that the talk was allowed to die a natural death. In fact, when, after the first of the year 1918, an oil administrator was appointed in the person of Mark L. Requa of California, he allowed no time to elapse before announcing that there would be no government interference with the industry so long as the producers continued to exert themselves to make the production totals as large as possible and so long as profiteering was eliminated as a factor in the market.

Regulations Made.

True, fuel oil control regulations were promulgated to insure the receipt of necessary fuel for certain industries named as "essential," but the main difficulty in supplying an ample supply of oil was not to be blamed to indifference or lack of co-operation on the part of the industry itself. The main difficulty was in the lack of transportation facilities, the scarcity of tank cars, and the nation-wide railroad conditions, which forbade the passage of millions of tons of freight because of the demands made upon them for rolling stock to transport certain essentials, both for this country and our allies. The bitter weather of the long winter, with the demand for extra fuel and the insistence of the railroad board that food and fuel should be given right of way were both factors which exercised no small influence upn the industry, and even as we go to press a long list of preferred essential industries are making vigorous protest to Washington that unless fuel oil shall be provided the loss in production of many essential commodities will prove a disastrous one.

Production Increased 21,000,000 Barrels.

In the table as shown herewith, covering the production of crude oil in the several fields of the country for the past four years—1914, 1915, 1916 and 1917—the figures are illuminative, although they are not final, since every petroleum expert presents his own totals, and they differ to a greater or less degree. It is, however, generally admitted that the total production this year exceeds that of last year by approximately 21,000,000 barrels.

This is an achievement which should not be minimized, for the only feature of the year satisfactory to the producer was the increase in the quotations for oil. That these were not sufficient is the opinion of thousands of producers—yet, had it not been for the attitude of the Federal Government and the possibility that the President, under the power given him by Congress, might exercise the right to fix prices and control both production and distribution, the probability is that more changes would have been registered in the prices of both crude and refined petroleum.

The Factor of Supplies.

Take the item of oil well supplies. From the beginning of the year the tendency in cost of these essentials was upward, and when, as was necessary because of war demands, the government took over the output of the steel mills and gave preferential treatment to the shipment of iron and steel for the Allies, it soon came about that prices for piping, well supplies, casing, drill spindles, etc., jumped enormously. In fact, the range of increase ran from 50 to more than 200 per cent. in some cases, with the result that the wildcatter who could not afford such exorbitant sums cut-down his work. Under these conditions it is surprising that the final production achieved such a satisfactory total.

There is another factor which is evidenced by a study of the detailed and elaborate reviews from Reporter correspondents in the several oil fields—the increased amount of petroleum obtained from wells of smaller caliber than have heretofore been pumped. Pennsylvania affords a shining example of what can be done when the government requires oil, for hundreds of "strippers" and small pumpers were operated which, under ordinary conditions, or even a year ago, would not have been economically producers.

But One Real New Pool.

The only real gusher pool of the year was that in Towanda township, Butler county, Kansas, and that was soon minimized by an inrush of salt water caused by over-drilling on the part of operators who, in their anxiety to get all the crude they could, penetrated the bottom strata of the sands and let loose a flood of salt water with disastrous results.

Prospects for 1918.

Having set the pace in 1917, and with the establishment of new usage in the pumping of wells so small that a few years ago they would have been plugged as unsatisfactory, there is a general opinion that the production for the coming year will eclipse all previous records. There is a demand and a market at high prices for every gallon of crude that can be produced. Oil Administrator Requa and his assistant, Mr. O'Donnell, are on record that the government will come to the aid of the producer, and through the provision of supplies and the betterment of transportation afford relief from the handicaps of the past year. If such is the case, the crude production totals of the year 1918 will be surprising—there can be no other outcome.

There is no space available to take up the work in the several fields in detail—that has been done by the expert correspondents of the Reporter who are on the spot, and who, from personal observation are in a position to give exact details and enumerate contributing causes, as they have done in the following pages. It is interesting to note, however, the following field summary, with comparisons, for last year as indicative of what has been accomplished:—

Production of Crude Oil in 1914, 1915, 1916 and 1917.

Fields.	Barrels 1917.	1916.	1915.	1914.
Eastern fields	19,860,169	20,724,836	20,333,483	22,436,771
Ohio-Indiana	3,809,170	2,606,831	3,979,467	4,603,276
Illinois	11,520,108	16,349,274	15,588,493	19,330,245
Kentucky-Tennessee	4,015,639	1,244,752	479,396	516,110
Mid-continent	135,632,794	122,671,767	121,988,915	101,002,263
Gulf coast	25,050,295	21,848,115	20,355,259	11,980,000
Texas Panhandle	10,930,507	8,852,585	6,591,422	8,513,367
Northern Louisiana	8,779,415	11,848,301	14,730,713	12,507,436
California	97,267,832	91,916,019	89,725,776	162,871,907
Wyoming	9,460,000	8,030,000	5,164,737	4,360,000
Other States	200,000	205,000	200,000	180,000
Totals	326,325,939	306,297,760	298,137,631	287,119,667

1917 Field Summary.

	Comp.	Prod.	Dry.	Gas.	New work.
January	1,434	94,391	245	151	3,893
February	1,590	105,219	302	181	4,312
March	1,490	123,038	290	143	4,397
April	1,685	91,542	330	162	4,220
May	1,960	105,300	460	161	4,238
June	2,003	123,063	431	165	4,124
July	1,977	130,838	411	157	4,273
August	1,841	154,551	463	136	4,378
September	2,040	145,152	486	183	4,506
October	2,408	141,518	491	186	4,969
November	2,186	86,785	462	200	4,738
December	1,723	80,835	407	139	4,908
Totals—					
1917	22,355	1,382,732	4,718	1,964	....
1916	23,834	1,497,405	3,993	1,761	....
Difference.	1,479	114,673	725	203	....

The figures by divisions are as follows:—

	Comp.	Prod.	Dry.	Gas.
Pennsylvania	5,435	35,549	985	762
Lima-Indiana	800	12,318	140	17
Central Ohio	582	901	139	406
Kentucky-Tenn.	1,651	35,652	411	60
Illinois	647	10,138	151	7
Kansas	3,469	325,410	547	172
Oklahoma-Ark.	6,717	360,896	1,334	409
Texas Panhandle	1,020	50,998	262	18
North Louisiana	472	60,299	110	56
Gulf Coast	1,562	490,571	639	57
Total, 1917	22,356	1,382,732	4,718	1,964

Pipeline Runs, Deliveries and Stocks.

It is unfortunate that, even within two months after the close of the year, no official figures can be obtained of exact runs, deliveries and stocks from all the fields. In some localities, such as Wyoming, records are not complete, and other compilations do not take into consideration California and the scattered production in Mississippi, Alabama and other localities, such as Arizona and New Mexico, with the result that figures are not to be obtained in tabular form.

To offset this, however, we have the totals as submitted by our correspondents and those compiled by the United States Geological Survey—the latter admittedly incomplete and more or less inaccurate.

Production figures are indicative of the runs from the wells, and further details are given in every field report, but, in view of the enormous demand for crude, the largely increased consumption and the fact that production did not come within 15,000,000 barrels of meeting consumptive demands, the final stock reports will be found of interest:—

Stocks Declined Sharply.

January 1, 1918, the best available estimates of stocks of crude oil held by pipelines and in field storage tanks in the mid-continent, Louisiana, Texas and California, as well as the high-grade fields east of the Mississippi River, showed that the oil held amounted to approximately 144,565,000 barrels, as against 159,786,400 barrels held in the same districts on January 1, 1917. In this recapitulation Wyoming is not included because exact figures are not obtainable, for no one but the producers themselves know how much oil is held in Wyoming. The withdrawn land proposition is a factor there, and it is asserted that, should government regulations be changed in this respect, about 10,000,000 barrels of oil will be released in Wyoming in a very short time. If the stock figures for these two dates are accurate—and they are approximately so—it will be seen at once that there was a reduction in oil stocks in 1917 of at least 15,200,000 barrels, which would bring the total consumption of oil during the year above 342,000,000 barrels, an increase of about 30,000,000 barrels over the previous year.

High and Low Estimates.

The Geological Survey, to the contrary, places the consumption at 312,438,599 barrels, which is much too small, since no oil expert places the total under 326,000,000 barrels. A. C. Bedford, chairman of the board of the Standard Oil Company of New Jersey, and also chairman of the Petroleum War Service Committee, under whose direction the government arrangements for petroleum are made, places the production for the year at no less than 328,500,000 barrels, of which 157,000,000 barrels were put out in the first six months and 171,500,000 during the last half year. He puts the consumption at the surprising total of 383,500,000 barrels, including some 35,000,000 barrels from Mexico.

Prices for Crude.

There were few changes relatively speaking in the price of crude oil during the year, but prices ruled high during the entire period. Pennsylvania oil established a new record for 40 years, and other crudes did not lag far behind. All this data will be found in easily-studied tabular form elsewhere in this section of the Annual Review.

Exports of Petroleum Products.

Never were such difficulties experienced in the shipment for foreign consumption of petroleum and its products. Abnormal demands for fuel oil for the Allied navies and for internal combustion engines; the high price of gasoline abroad consequent upon motor lorry and ambulance use at the front; the necessity for lubricants for all sorts of machinery, either directly employed for war purposes or in foreign factories and shops—all these resulted in an outpouring of oil never before experienced.

The totals of the various products for the calendar year ending December 31 tell their own story:—

Total Mineral Oils.

	Gallons.	Value.
1917	2,623,053,026	$253,027,075
1916	2,607,491,209	201,732,563
1915	2,329,575,617	142,972,322
1914	2,240,033,652	139,900,587

Gas and Fuel Oil.

	Gallons.
1917	125,489,835
1916	967,518,417
1915	799,589,047
1914	634,298,844
1913	359,008,618

This enormous increase is due largely to the use of fuel oil as a motive power for warships and for other war uses, but it explains the demand upon the black oils and kerosene distillates and their consequent scarcity as the war progressed.

Gasoline.

	Gallons.
1917	224,811,491
1916	167,928,262
1915	112,562,929
1914	162,669,038

Scarcity of Tonnage.

The extraordinary demand for steamers for war purposes, the commandeering of tankers, the control of shipments by the Shipping Board, the scarcity of containers, of barrels and drums all exercised an influence upon the export market as will be seen by the accompanying price tables, and yet illuminating oil in barrels rose only from a low of 8.65 cents a gallon in January to 12.15 cents in December; illuminating oil in cases rose from a low of 11.75 cents a gallon in January to 16.50 in December; auto gasoline 68@72 rose from 32.75c. in January to 38.50c. a gallon, a net gain at the close of 5.75c. Stove gasoline closed at a net gain of 3.75c. a gallon; naptha 73@76 closed at an advance of 6.75c. Similar advances were registered all through the list, but they were charged to increases in containers in the majority of cases and apparently with firm basis of fact. Details of the changes are given herewith.

In the matter of charters, 1917 was but little the better of 1916 in New York city, due, of course, to the scarcity of tonnage and not to the lack of demand. The total charters from the port of New York for petroleum for the year were 12,739,163, as compared with 12,300,021 in 1916 and 13,830,855 in 1915.

Local Markets.

There was so little real change in the domestic market for refined and gasoline during the past year that it is not worthy of extended comment. The lubricating oils were in exceedingly firm demand, and many grades were at times unobtainable, or if to be had were only to be found in very small quantities. This condition still obtains in large degree.

Detailed statistical information as to prices, production, exports and other facts in regard to the petroleum industry will be found in subsequent pages.

Crude Oil Market Prices During 1917 Established New High Records With Every Step Higher.

With a constant uplift in prices for crude in every field but one during the year, although the changes did not occur with the swiftness and the regularity which marked the year 1916, the crude market was of more than usual interest.

Pennsylvania, which opened at $2.85, closed at $3.75, and it was not long after the first of the year before the $4 a barrel mark was reached, which surpassed any figure ever made under normal conditions, and forced the historian back to the early '70s to find a parallel. The majority of the changes in this market, as will be seen from the detailed tabular presentation herewith, were made prior to August, and despite the fact that everything pointed to an increase—higher cost of labor, materials, transportation, etc., etc.—but two advances were made in Pennsylvania after August 13. The first was an uplift of 25 cents on August 20, the next a similar increase on December 4. On February 8, 1918, another 25 cents a barrel was posted.

In the following table will be found the closing price, the 1916 high, and the 1915 low, the latter representing the beginning of the upward movement

SOUTHERN OIL CORPORATION

Petroleum and Its Products

Refiners of

High Grade Cushing Crude Gasoline—
Naphtha—Kerosene—Gas Oil—Fuel Oil

Fuel Oil on Track in Chicago and in Transit at all Times Insuring Quick Delivery

Sales Offices:
Rookery Building
209 So. La Salle Street
Chicago, Illinois

General Offices:
Kennedy Building
Tulsa, Oklahoma

Refinery:
Yale, Oklahoma

BUY—SELL

MIDWEST REFINING CO.
MERRITT OIL CORPORATION
ELK BASIN PETROLEUM CO.
INTERNATIONAL PETROLEUM
IMPERIAL OIL CO., LTD.
LOBITOS OILFIELDS, LTD.
SAPULPA REFINING CO.
HOUSTON OIL CO.
PORT LOBOS PETROLEUM
NATIONAL FUEL GAS CO.
NORTHWEST OIL CO.
COSDEN AND CO.
BONDS AND STOCK

CARL H. PFORZHEIMER & CO.
DEALERS IN STANDARD OIL SECURITIES.
25 BROAD ST., N. Y. PHONES 4000-1-2-3-4 BROAD

STANDARD OIL ISSUES

WEEKLY SUMMARY — STATISTICAL BOOKLET

CARL H. PFORZHEIMER & CO.
DEALERS IN STANDARD OIL SECURITIES
25 BROAD ST., NEW YORK PHONES 4000-1-2-3-4 BROAD

CRUDE OIL PRICE CHANGES IN THE SEVERAL FIELDS BY DATES IN 1917.

	January											Feb.	March			April		May	August						Dec.
	2.	3.	4.	5.	6.	8.	9.	12.	13.	23.	27.	30.	15.	4.	9.	17.	16.	17.	15.	1.	13.	13.	16.	16.	18.	20.	22.	4.
Pennsylvania	$2.85	....	....	$2.95	....	....	$3.05	....	....	....	....	....	....	....	....	....	....	$3.10	....	....	....	$3.25	....	....	....	$3.50	....	$3.75
Mercer, black	2.30	....	....	2.35	....	....	2.43	....	....	....	....	....	....	....	....	....	....	2.45	$2.18	....	....	2.23	....	....	....	....	....	....
Corning	2.25	....	....	2.30	....	....	2.38	....	....	....	....	....	....	....	....	....	....	2.40	....	....	....	2.50	....	....	....	2.60	....	2.80
Cabell	2.22	....	....	2.27	....	....	2.35	....	....	....	....	....	....	....	....	....	....	2.37	....	....	....	2.47	....	....	....	2.57	....	2.72
Somerset	2.05	....	....	2.10	....	....	2.18	....	....	....	....	....	....	....	....	....	....	2.20	....	....	....	2.30	....	....	....	2.40	....	2.55
Ragland	.95	....	....	.97	....	....	1.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.10	....	....	....	....	....	1.20
North Lima	1.68	....	....	....	....	$1.78	....	....	....	....	$1.83	....	....	....	....	....	$1.83	....	....	....	....	....	....	$2.08	....	....	....	....
South Lima	1.68	....	....	....	....	1.78	....	....	....	....	....	1.83	....	....	....	....	1.88	....	....	....	....	....	....	2.08	....	....	....	....
Indiana	1.53	....	....	....	....	1.63	1.68	....	....	....	....	1.73	....	....	....	....	1.78	....	....	....	....	....	....	1.98	....	....	....	....
Illinois	1.72	....	....	....	....	1.82	....	....	....	....	....	1.87	....	....	....	....	1.92	....	2.18	....	....	....	....	2.12	....	....	....	....
Princeton	1.72	....	....	....	....	1.82	....	....	....	....	....	1.87	....	....	....	....	1.92	....	2.18	....	....	....	....	2.12	....	....	....	....
Wooster	1.90	....	....	....	....	2.00	....	....	....	....	....	2.05	....	....	....	....	2.10	....	2.18	....	....	....	....	2.36	....	....	....	....
Plymouth	1.53	....	$1.63	....	....	1.73	....	....	$1.83	....	....	....	....	....	....	....	....	....	2.18	....	....	....	....	2.06	....	2.13	....	....
Kansas	1.40	$1.50	....	....	$1.60	....	1.70	....	....	....	....	....	....	....	....	....	....	....	2.18	....	....	....	....	....	$1.90	....	$2.00	....	....
Caddo 38	1.40	1.50	....	....	....	1.60	....	....	....	$1.70	....	....	....	....	$1.80	$1.90	....	....	2.18	....	....	....	....	....	....	....	....	....
Caddo 35-37.9	1.30	1.40	....	....	....	1.50	....	....	....	1.60	....	....	....	....	1.70	1.80	....	....	2.18	....	....	....	....	....	....	....	$2.00	....
Caddo 32-34.9	1.25	1.35	....	....	....	1.45	....	....	....	1.55	....	....	....	....	1.65	1.75	....	....	2.18	....	....	....	....	....	....	....	1.90	....
Caddo, heavy	.85	....	....	....	....	.95	....	....	....	....	....	....	....	....	....	....	....	....	2.18	....	....	....	....	....	....	....	1.85	....
De Soto	1.30	1.40	....	....	....	....	1.50	....	....	....	1.60	....	....	$1.00	1.70	1.80	....	....	2.18	....	....	....	....	....	....	....	....	....
Crichton	1.10	....	....	....	1.20	....	....	....	....	1.50	....	1.40	....	....	....	....	....	....	2.18	....	....	....	....	....	....	....	1.90	....
Electra	1.40	....	1.50	....	....	1.60	....	....	1.70	....	....	....	....	....	....	....	....	....	2.18	....	....	....	....	....	....	....	1.50	....
Henrietta	1.40	....	1.50	....	....	1.60	....	....	1.70	....	....	....	....	....	....	....	....	....	2.18	....	....	....	....	1.90	....	2.00	....	....
Corsicana, light	1.40	....	1.50	....	....	1.60	....	....	1.70	....	....	....	....	....	....	....	....	....	2.18	....	....	....	....	1.90	....	2.00	....	....
Corsicana, heavy	.75	....	.80	....	....	.85	....	....	....	....	....	....	....	....	....	....	....	....	2.18	$0.95	$1.00	....	....	1.05	....	....	....	....
Thrall	1.40	....	1.50	....	....	1.60	....	....	1.70	....	....	....	....	....	....	....	....	....	2.18	....	....	....	....	1.90	....	2.00	....	....
Strawn	1.40	....	1.50	....	....	1.60	....	....	1.70	....	....	....	....	....	....	....	....	....	2.18	....	....	....	....	1.90	....	2.00	....	....
Moran	1.40	....	1.50	....	....	1.60	....	....	1.70	....	....	....	....	....	....	....	....	....	2.18	....	....	....	....	1.90	....	2.00	....	....
Yale	1.40	....	1.50	....	....	1.60	....	....	1.70	....	....	....	....	....	....	....	....	....	2.18	....	....	....	....	1.90	....	2.00	....	....
Healdton	.75	....	.80	....	....	.85	....	....	.90	....	....	....	....	....	....	....	....	....	2.18	1.00	1.10	....	....	1.15	....	1.20	....	....
Canada	2.08	....	....	....	....	2.18	....	....	....	....	....	2.23	....	....	....	....	2.28	....	2.18	....	....	....	....	2.43	....	....	....	....

which has marked the progress of the war:—

Grade.	1917. Close.	1916. High	1915. Low.
Pennsylvania	$2.75	$2.85	$1.35
Corning, O.	2.30	2.25	.83
North Lima, O.	2.08	1.73	.83
Plymouth, O.	2.03	1.68	.43
South Lima, O.	2.08	1.73	.83
Wooster, O.	2.38	2.00	1.10
Cabell, W. Va.	2.72	2.22	.97
Somerset, Ky.	2.55	2.05	.80
Ragland, Ky.	1.20	.95	.63
Indiana	1.98	1.58	.78
Princeton, Ind.	2.12	1.82	.84
Illinois	2.12	1.82	.84
Kansas-Oklahoma	2.00	1.55	.46
Healdton, Okla.	1.20	.80	.30
Caddo, La., heavy	.85	.80	.35
Caddo, La., light	2.00	1.55	.60
Corsicana, Texas, heavy	1.05	1.55	.45
Corsicana, Texas, light	2.00	1.55	.45
Electra, Texas	2.00	1.55	.45
Henryetta, Texas	2.48	1.55	.45
Canadian	2.48	2.13	1.28

Year's Opening and Closing Field Prices.

A comparison of last year's opening and closing quotations follows:—

EASTERN STATES.

	Per barrel—Opening.	Closing.
Pennsylvania	$2.85	$3.75
Cabell, Pa.	2.22	2.72
Mercer, black	2.30	2.23
New Castle, Pa.	2.15	....
Corning, Ohio	2.25	2.80
Somerset, Ky.	2.05	2.55
Ragland, Ky.	.95	1.20

CENTRAL WEST.

	Per barrel—Opening.	Closing.
Wooster	$1.80	$2.38
North Lima, Ohio	1.68	2.08
South Lima, Ohio	1.58	2.08
Indiana	1.43	1.98
Princeton, Ind.	1.62	2.12
Illinois	1.62	2.12
Plymouth	1.33	2.03

OKLAHOMA-KANSAS.

	Per barrel—Opening.	Closing.
All grades except Healdton	$1.40	$2.00
Healdton, 32 deg. and above.	.75	1.20

NORTHWESTERN LOUISIANA.

	Per barrel—Opening.	Closing.
Caddo, La., 38 deg. and above	$1.40	$2.00
35 to 37.9 deg.	1.30	1.90
32 to 34.9 deg.	1.25	1.85
heavy	.85	1.00
De Soto	1.10	1.90
Crichton	1.10	1.40

NORTH TEXAS.

	Per barrel—Opening.	Closing.
Corsicana, light	$1.40	$2.00
heavy	.75	1.05
Electra	1.40	2.00
Henrietta	1.40	2.00
Strawn	1.40	2.00
Thrall	1.40	2.00
Moran	1.40	2.00
Yale	2.00	1.50

GULF COAST.

	Per barrel—Opening.	Closing.
Humble	$0.80	$1.00
Saratoga	.70	1.00
Sour Lake	.80	1.00
Spindletop	1.05	1.05
Batson	.70	1.00
Vinton	.80	1.00
Dayton	.70	1.00
Goose Creek	.70	1.00
Jennings	.80	1.00
Markham	.75	1.00
Edgerly	.95	1.00

WYOMING.

	Opening.	Per barrel—Closing.
Grass Creek	$1.70	..
Elk Basin	1.70	..
Big Muddy	1.15	..

CALIFORNIA.

	Per barrel—Opening.	Closing.
Kern River, Midway-Sunset, McKittrick, Lost Hills-Belridge, Coalinga—		
14 to 17.9 deg.	$0.98	$0.73
18 to 18.9 deg.	.99	.74
Prices are 1c. higher per barrel for each increase in gravity of one full degree above 18 degrees to and inclusive 24.9 degrees.		
25 to 25.9 deg.	1.07	.82
Prices are 2c. higher per barrel for each increase in gravity of one full degree above 25 degrees.		
Ventura county—		
25 to 25.9 deg.	1.07	.82
Prices are 2c. higher per barrel for each increase in gravity of one full degree above 18 degrees to and inclusive of 30.9 degrees.		
Fullerton and Whittier and Santa Maria:—		
14 to 17.9 deg.	.98	.73
18 to 18.9 deg.	.99	.74
Prices are 1c. higher per barrel for each increase in gravity of one full degree above 18 degrees.		
25 to 25.9 deg.	1.07	.82

Prices are 2c. higher per barrel for each increase in gravity of one full degree above 25 degrees.

Oil of above 37 deg. gravity 6c. higher, with increases of 3c. per barrel for each full degree above 37 deg. gravity.

CANADA.

	Per barrel—Opening.	Closing.
Canada	$2.48	$1.98
Petrolia	2.28	1.88
Oil Springs	2.15	1.95

Price Changes in Illuminating Oils.

The price changes in the export quotations for illuminating oils with four years' high and low prices follow:—

	Cents per gallon—Bulk.	Barrels.	Cases.
January 1	4.50	8.65	11.75
January 9	4.75	8.90	12.00
January 12	5.00	9.15	12.25
February 6	5.00	9.75	12.25
March 7	5.25	10.00	12.50
March 12	5.50	10.25	12.75
July 19	5.50	10.35	13.25
August 1	5.50	10.35	14.25
August 6	5.50	10.35	14.75
September 20	5.50	10.35	15.50
October 17	5.50	10.35	15.50
November 8	5.50	11.15	15.50
November 26	6.50	12.15	16.50
December 14	6.50	12.50	16.50
1917, high	6.50	12.50	16.50
low	4.50	8.65	11.75
1916, high	5.25	9.10	11.50
low	4.50	8.35	10.75
1915, high	5.00	8.75	11.25
low	4.10	7.50	9.75
1914, high	5.25	8.75	11.25
low	4.75	8.25	10.75

Price Changes in Lubricating Oils.

The year's changes in the lubricating oil market are shown by the following comparison of opening and closing prices:—

	Opening.	Closing.
Black—		
reduced, 29 gravity, 25@30 cold test	13½@14	19 @20
29 gravity, 15 cold test	14 @15	19 @20
summer	13 @14	19 @20
Cylinder—		
light filtered	21 @26	34 @35
dark filtered	18 @19	33 @34
extra cold test	26 @31	43 @48
dark steam refined	15 @19	24 @25
Natural West Virginia—		
29 gravity	26½@27	—@—
filtered lemon, 37½@38 gravity	21½@22	—@—
gravity	21½@22	—@—
32@34 gravity, bloomless	21½@22	—@—
31 gravity, wool grade	19½@22	—@—
Paraffine—		
high viscosity	29½@30	36 @37
903 specific gravity	21½@22	29 @30
865 specific gravity	18½@19	31 @22
red paraffine	18 @19	29 @34
Spindle—		
No. 200	24 @25	35 @36
No. 160	23½@24	—@—
No. 110	23 @23½	—@—
No. 80	21 @22	—@—
filtered	28 @35	—@—

Gasoline, High and Low.

The comparative prices on the gasoline and naphtha groups, domestically in New York City, on December 31, 1916, and December 31, 1917, were as follows:—

	Dec. 31. 1916.	Dec. 31. 1917.
Motor gasoline (garages), steel barrels	22.00	24.00
Motor gasoline to consumers.	24.00	26.00
Naphtha, varnish makers and painters, deodorized, steel barrels	22.00	22.00
Wooden barrels	24.00	27.00
Gasoline, machine	40.00	41.00
73@76 deg., steel barels	31.00	33.00
73@76 deg., wooden barrels	34.00	37.00
70@72 deg., steel barrels	29.00	31.00
70@72 deg., wooden barrels	32.00	35.00
68@70 deg., steel barrels	28.00	30.00
68@70 deg., wooden barrels	31.00	34.00

The following table of comparisons shows the high and low for gasoline in the New York market for the last five years:—

	High. Cents.	Low. Cents.
1917	26	22
1916	24	21
1915	21	12
1914	16	13
1913	17	16
1912	16	9
1911	11	9

TOTAL EXPORTS MINERAL OILS, 1915, 1916 AND 1917

The exports of mineral oils, by months, since the first of January, 1917, and the comparative figures for the years 1915 and 1916, by classifications, will be found herewith:—

Crude.

	1917. Gallons.	1916. Gallons.	1915. Gallons.
January	13,149,318	14,969,087	13,529,892
February	17,215,981	13,827,080	9,112,599
March	16,378,585	11,593,059	14,140,838
April	14,653,999	14,811,620	8,863,482
May	6,577,536	13,102,514	11,821,211
June	22,044,782	15,999,018	21,361,680
July	6,291,853	10,533,948	11,755,109
August	12,192,207	17,994,796	15,630,236
September	10,859,554	15,430,766	15,149,839
October	21,170,505	14,620,735	12,518,427
November	7,434,253	14,216,933	13,594,958
December	23,315,439	14,947,082	10,784,798
1917		171,284,262	
1916		172,029,903	
1915		158,263,060	
1914		124,735,559	
1913		194,569,634	

*Gas and Fuel Oil.

	1917. Gallons.	1916. Gallons.	1915. Gallons.
January	107,150,343	56,232,785	45,970,213
February	57,573,107	71,214,590	54,573,471
March	89,978,337	73,193,011	40,522,505
April	61,679,952	54,065,947	53,132,192
May	85,759,841	87,776,024	63,486,774
June	93,850,658	69,783,184	56,315,948
July	.....	99,049,882	71,532,643
August	.....	90,756,572	83,609,878
September	.....	98,823,397	91,726,855
October	.....	80,629,255	85,352,376
November	.....	92,409,868	72,270,888
December	.....	83,583,932	81,095,304

Exports for Five Years.

1917 (total 6 mos.)	495,992,238
1916	957,518,417
1915	799,589,047
1914	634,298,844
1913	359,008,618

* Stated separately after July 1, 1917.

Fuel Oil.

	1917. Gallons.
July	63,694,163
August	107,082,283
September	115,775,120
October	93,207,074
November	78,217,537
December	139,220,581
Total for 6 months	597,196,708

Gas Oil.

	1917. Gallons.
July	5,957,403
August	6,382,158
September	3,792,659
October	4,789,479
November	2,346,945
December	9,032,250
Total for 6 months	32,300,889

Illuminating Oil.

	1917. Gallons.	1916. Gallons.	1915. Gallons.
January	97,128,906	62,424,837	58,305,568
February	45,507,551	57,956,070	54,089,523
March	59,898,456	83,730,397	71,875,525
April	63,168,581	50,132,438	58,532,778
May	49,764,675	73,968,054	92,322,467
June	67,381,426	75,188,940	81,778,653
July	28,446,670	72,299,652	79,203,323
August	45,936,349	74,328,094	80,334,711
September	29,665,750	90,125,663	68,425,038
October	43,949,214	79,414,772	70,657,867
November	58,541,832	56,555,053	55,552,005
December	63,275,862	78,121,092	65,381,207

Exports for Five Years.

1917	652,724,866
1916	854,403,313
1915	836,958,666
1914	1,010,449,253
1913	1,119,441,243

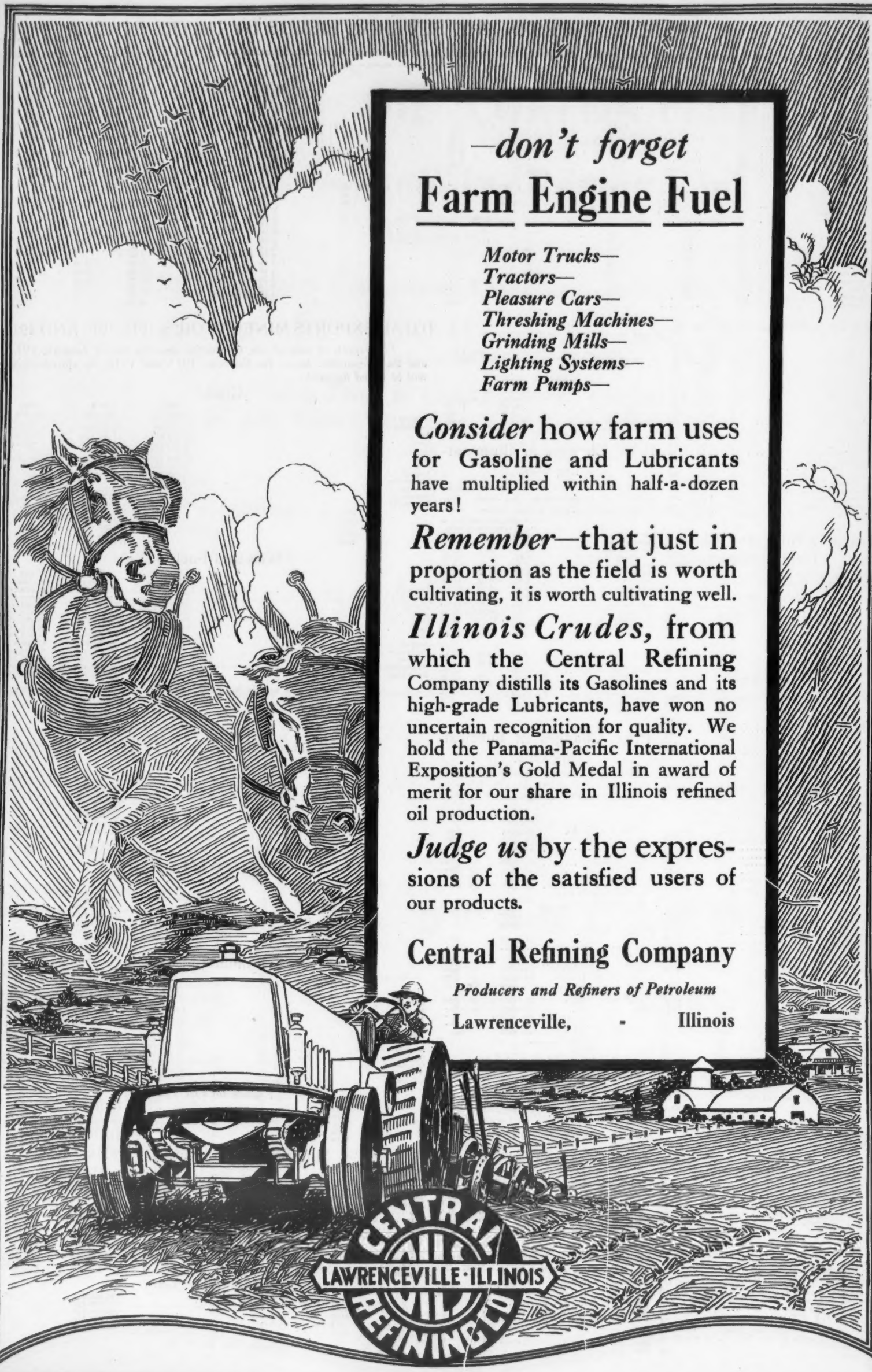
*Lubricating and Heavy Paraffin.

	1917. Gallons.	1916. Gallons.	1915. Gallons.
January	23,484,959	19,583,401	16,916,997
February	16,260,429	18,358,167	11,830,237
March	21,248,195	18,894,751	17,398,506
April	25,009,724	18,395,454	25,900,105
May	24,012,737	25,688,165	22,616,897
June	27,970,927	27,212,148	23,261,204
July	.....	25,877,763	24,998,182
August	.....	27,593,849	22,863,944
September	.....	23,814,936	18,672,716
October	.....	19,975,967	18,193,621
November	.....	18,652,773	18,744,561
December	.....	16,520,289	18,282,306

Exports for Five Years.

1917 (total for 6 months)	138,866,971
1916	260,779,127
1915	239,678,725
1914	191,647,570
1913	207,639,092

* Stated separately after July 1, 1917.



—don't forget

Farm Engine Fuel

Motor Trucks—
Tractors—
Pleasure Cars—
Threshing Machines—
Grinding Mills—
Lighting Systems—
Farm Pumps—

Consider how farm uses for Gasoline and Lubricants have multiplied within half-a-dozen years!

Remember—that just in proportion as the field is worth cultivating, it is worth cultivating well.

Illinois Crudes, from which the Central Refining Company distills its Gasolines and its high-grade Lubricants, have won no uncertain recognition for quality. We hold the Panama-Pacific International Exposition's Gold Medal in award of merit for our share in Illinois refined oil production.

Judge us by the expressions of the satisfied users of our products.

Central Refining Company

Producers and Refiners of Petroleum

Lawrenceville, - Illinois

CENTRAL OIL REFINING CO
LAWRENCEVILLE · ILLINOIS

Paraffin.

	1917. Gallons.
July	671,043
August	1,189,949
September	301,050
October	1,123,587
November	2,075,374
December	1,012,729
Total for 6 months	6,373,737

Other Lubricating.

	1917. Gallons.
July	16,771,816
August	22,057,100
September	20,127,915
October	25,478,483
November	23,072,265
December	28,188,049
Total for 6 months	135,695,628

Gasoline.

	1917. Gallons.	1916. Gallons.	1915. Gallons.
January	21,289,070	5,939,384	7,957,989
February	13,731,087	3,806,093	17,292,897
March	12,893,190	9,787,937	16,435,783
April	16,604,130	9,781,561	10,071,792
May	28,957,646	12,249,661	9,223,970
June	24,069,647	17,703,836	10,770,406
July	9,921,998	23,774,610	7,236,917
August	17,821,260	25,590,533	8,279,278
September	14,302,291	15,203,115	4,612,832
October	17,806,587	13,309,606	6,642,046
November	29,780,658	16,991,773	10,069,254
December	17,663,927	13,770,049	4,019,755

Exports for Five Years.

1917	224,811,491
1916	167,928,262
1915	112,562,929
1914	162,669,038
1913	359,008,618

Other Light Products of Distillation.

	1917. Gallons.	1916. Gallons.	1915. Gallons.
January	16,776,174	11,190,588	5,666,700
February	8,176,969	13,931,507	6,053,804
March	11,713,134	19,856,303	5,509,158
April	19,100,889	10,075,274	14,187,422
May	17,377,111	18,507,272	16,094,600
June	29,266,274	17,234,709	17,602,424
July	12,154,245	24,295,236	17,032,778
August	12,772,158	16,751,441	22,298,263
September	5,777,468	23,124,660	16,422,328
October	13,434,175	16,501,794	11,857,595
November	27,215,359	6,831,239	17,355,256
December	17,672,050	9,995,273	18,875,815

Exports for Five Years.

1917	191,436,006
1916	188,288,863
1915	169,046,052
1914	47,023,617
1913	70,315,093

Residuum.

	1917. Gallons.	1916. Gallons.	1915. Gallons.
January	37,749	2,791,014	25,228
February	26,113	215,929	45,066
March	805	2,976,406	2,424,507
April	44,105	178,927	183,528
May	79,898	62,696	2,345,146
June	183,728	114,711	389,058
July	89,477	43,822	5,624,254
August	53,786	24,076	428,091
September	85,328	58,094	614,009
October	16,584	74,686	101,094
November	51,152	29,490	285,050
December	51,495	.....	.....

Exports for Five Years.

1917	720,220
1916	6,543,324
1915	12,627,162
1914	69,209,777
1913	67,863,755

Total Refined.

	1917. Gallons.	1916. Gallons.	1915. Gallons.
January	265,837,201	158,162,009	134,842,714
February	141,275,256	165,982,356	143,884,998
March	195,732,117	208,438,805	154,255,983
April	185,607,381	142,629,596	162,007,817
May	188,536,707	218,271 874	206,599,354
June	236,766,465	207,237,588	190,117,693
July	137,667,820	245,310,965	205,628,047
August	213,294,988	235,044,565	217,814,165
September	189,827,581	251,149,865	200,473,778
October	190,805,183	209,606,159	192,804,599
November	221,301,122	191,470,185	174,277,014
December	276,116,943	177,521,065	187,816,518

Exports for Five Years.

1917	2,451,768,764
1916	2,449,228,140
1915	2,171,312,548
1914	2,115,298,099
1913	1,941,996,087

Total Mineral Oils.

	1917. Gallons.	1916. Gallons.	1915. Gallons.
January	278,986,519	173,131,096	148,372,606
February	158,491,237	179,809,436	152,997,597
March	212,110,702	220,031,864	168,396,821
April	200,261,380	157,441,216	170,871,209
May	195,114,243	231,374,388	218,420,565
June	258,111,197	223,236,606	211,479,373
July	143,959,673	255,844,913	217,383,156
August	225,487,195	253,039,361	233,444,401
September	200,687,435	266,580,631	215,623,617
October	220,975,688	224,226,894	205,323,026
November	228,735,375	205,687,118	187,871,972
December	299,432,382	192,468,137	198,601,316

Exports for Five Years.

1917..	Total gallons	2,623,053,026
	Value	$263,027,075
1916..	Total gallons	2,607,491,209
	Value	$201,732,563
1915..	Total gallons	2,329,575,617
	Value	$142,972,322
1914..	Total gallons	2,240,033,652
	Value	$139,900,587
1913..	Total gallons	2,136,565,721
	Value	$149,316,409

Situation in Foreign Markets More Directly Reflected War Exigencies.

Any consideration of foreign petroleum markets during the year must be based upon conditions in Great Britain, for which the withdawal of Russia and Roumania is sources of supply, the wrecking of the Roumanian and Galician wells, and the German occupation of important petroleum-producing territory consumers were brought face to face with a peculiarly trying situation.

Early U-boat raids were disastrous to American tankers, and it was soon apparent that abrupt departure from customary methods of handling and distributing petroleum products must be taken. The result was that the British Government took under its control the entire domestic industry, established radical regulations forbidding the use of gasoline by pleasure vehicles, and established a system of licenses which kept the motor spirit in the hands of those to whom it was essential. The demand for war purposes forced this action, and the result was an appreciable conservation of supply.

Naturally enough the prices for all petroleum products for overseas consumption were appreciably higher than in the United States. At the beginning of the year in the English market water white illuminating oil was quoted at 1s. 2½d. a gallon, with standard white 1d. a gallon cheaper. At the beginning of the year 1918 the price was 1s. 7½d. for water white and 1s. 6½d. for standard white. Motor spirit and all other products evidenced a similar expansion in price, motor spirit which sold a year ago at 2s. 10d. a gallon being quoted at 3s. 6d. a gallon in January, 1918, with the cheaper grades but slightly less.

Lubricants have also registered an increase of practically one-third during the year. In January, 1918, the higher class of pale lubricants were quoted at from £30 to £37 10s. a ton, with American car cylinder oils ranging from £29 10s. to £35 10s. per ton. A year ago the first variety brought £22 and the second £17 per ton.

The following table gives the prices of American standard white illuminating oils in pence a gallon ex-wharf in London and Liverpool:—

	London. High.	London. Low.	Liverpool. High.	Liverpool. Low.
January	13¼	13¼	13½	13½
February	13¾	13¾	13½	13½
March	14	13¾	14⅜	13½
April	14	14	14⅜	14⅜
May	15	14	14⅜	14⅜
June	14½	14	14⅜	14¼
July	15½	14½	15⅝	14¾
August	15½	15½	15⅝	15⅝
September	15½	15½	15⅝	15⅝
October	20½	15½	20⅝	15⅝
November	20⅝	18½	20⅝	18⅝
December	18½	18⅞	18⅝	18⅝

Export Price Ranges in Gasoline and Naphthas.

Last year's opening and closing prices for gasoline and the naphthas for export were as follows:—

Opening Prices.

NAPHTHAS, GASOLINE, ETC.

	10-gallon drums. Under 100 cases.	10-gallon drums. 100 cases and over.
Benzine, 59@62 deg.	34¼	33¾
Gasoline, stove	34½	34
Naphthas—		
Auto, 68@72 deg.	38	37½
73@76 deg.	42	41¾

	In cans and cases. Under 100.	In cans and cases. 100-199.
Benzine, 59@62 deg.	29½	29¼
Gasoline, stove	29¾	29½
Naphthas—		
Auto, 68@72 deg.	33¼	33
73@76 deg.	37¼	37
		200-299.
Benzine, 59@62 deg.		29
Gasoline, stove		29¼
Naphthas—		
Auto, 68@72 deg.		32¾
73@76 deg.		36¾

Closing Prices.

NAPHTHAS, GASOLINE, ETC.

	10-gallon drums. Under 100 cases.	10-gallon drums. 100 cases and over.
Benzine, 58@62 deg.	45½	45
Gasoline, stove	45¾	45¼
Naphthas—		
Auto, 68@72 deg.	51¼	49¾
73@76 deg.	55¼	54¾

NAPHTHAS, GASOLINE, ETC.

	In cans and cases. Under 100.	In cans and cases. 100-199.
Benzine, 59@62 deg.	33¼	33
Gasoline, stove	33½	33¼
Naphthas—		
Auto, 68@72 deg.	39	38¾
73@76 deg.	43	42¾
		200-299.
Benzine, 59@62 deg.		32¾
Gasoline, stove		33
Naphthas—		
Auto, 68@72 deg.		38½
73@76 deg.		42½

All gasoline and naphthas advanced 1 cent January 10; advanced ½ cent July 19; advanced 1 cent August 1; ½ cent August 6; naphthas and gasoline in 10-gallon drums advanced 2¼ cents a gallon August 21; gasoline and naphthas in cases advanced ¾ cent September 20; naphthas and gasoline, in 10-gallon drums only, increased 7½ cents a gallon November 26.

HIGH-GRADE FIELDS OF EAST SHOW DECLINE IN WELLS AND PRODUCTION

Pennsylvania-New York Leads, With Kentucky Second—22 Pennsylvania Wells Had 5,896 Barrels of Production.

The high-grade petroleum fields east of the Mississippi River, comprising Southern New York, Pennsylvania, West Virginia, Southeastern, Central and Northwestern Ohio, Indiana, Illinois, Kentucky and Tennessee, for the year 1917 show a very successful year, regardless of the conditions that prevailed most of the year in the high cost of material and its scarcity, the heavy advance in the price per foot in drilling, the scarcity of labor, and numerous other things that have prevented real old-time drilling activity.

The oil trade in general has not been pushing the drill, as they would like to know more of what the tax is o be in case they secure a new production, or add to their old production. The oil men are all patriotic, but it is a known fact that the oil game is a hazardous one and dry holes are found in plenty while hunting production, and by adding a big tax to the already heavy burden they do not consider it safe to go too far in the work.

The old Pennsylvania field still maintains the lead in the number of wells finished in the high-grade section, but the new production of the Kentucky wells for the year is much larger than any of the other fields and is not going backward, but on the increase from day to day, and Tennessee is destined to follow in the wake of Kentucky. The prospects are good also for an oil field to the Southwest through the northwestern corner of Alabama and the southeastern part of Mississippi, thence into the Gulf of Mexico.

Record for Year 1917.

The real feature of the year in the petroleum industry is the large number of new companies that have entered the producing business, and many were incorporated that have not as yet gotten a start in development work. The two leading states for new concerns were Wyoming and Kentucky. Hardly a day passes but what several new concerns have been launched in either of the States; some are exceptionally good concerns, while others are a little on the hot-air style. These new companies have capitalization running into the millions. Some have merit and will survive and have a future, but many will disappear as their predecessors have done before them.

The price for oil is the best in the history of the industry, with prospects of further advances. Many of the refineries are paying a bonus price for the better grades of crude and are able to still make a nice profit.

The wells finished for the year in the various fields constituting the high-grade petroleum fields are as follows:

Field.	Completions.	Production.	Gas.	Dry.
Pennsylvania	2,580	9,631	265	353
West Virginia	1,637	14,711	433	257
Southeastern Ohio	1,246	11,278	55	356
Central Ohio	562	901	407	139
Northwestern Ohio	536	7,365	9	52
Indiana	267	4,919	9	84
Illinois	645	10,148	8	422
Kentucky	1,648	35,204	61	422
Tennessee	11	616	2	1
Totals	9,151	94,792	1,249	1,813
Fir 1916	10,204	110,437	1,154	1,904
Difference	1,053	15,645	96	9

The above figures show that there were 6,089 of the wells that are oil-producing wells, and the average production per well for the oil wells is close to 15½ barrels, and a large average for such a vast number of wells to be drilled in old fields that have to a large extent been producing for many years back.

Nail Down Your Oil Contract!

FOREHANDEDNESS is worth while.

What you buy for future delivery you are sure of. If a jobber, you can safely sell it under contract. If a large consumer, you know your needs are provided for. The oil you don't contract for, you may not be able to get!

Nail down your oil contracts. Then you can sleep easy. And if you value Quality and Service—as you must—you'll investigate what Johnson has to offer. For the present we can make interesting contracts, in tank-car quantities, on

Gasoline *Naphtha* *Kerosene*
Fuel Oil *Gas Oil*
Lubricants *Flux Oil* *Road Oil*

With demand for crude 30,000 barrels a day in excess of supply, it behooves you to act. A Johnson contract—if you make it today—is a liquid asset. Tomorrow it may be unobtainable.

We invite correspondence on tank-car oil supplies for shipment to all parts of the United States and the Dominion of Canada.

Johnson Oil Refining Company

Chicago Heights, Ill. Tulsa, Okla. Pittsburgh, Pa.

Ask Johnson

PENNSYLVANIA.

More Well Finished Than Any Other Section.

The Pennsylvania-Southern New York field for the year 1917 shows more wells finished than any other field in the high grade section, the total being 2,580, the next closest being the Kentucky field, which has but a few wells above the West Virginia fields. Ohio was really in second place when the fields of northwestern, central and southeastern Ohio are combined together, being all in one State and numbering 2,363 wells in the three divisions of the State. There were twenty-two oil wells in the select class finished in the Pennsylvania regions during 1917, of which the combined production amounted to 5,896 barrels. Of this number, thirteen were in Green county, four in Washington county, three in Clarion county, and two in Allegheny county.

Select Wells.

The oil wells were located by counties in the Pennsylvania fields as follows:—

County.	Oil wells.	Production, barrels.
Greene	13	4,771
Washington	4	400
Clarion	3	500
Allegheny	2	225
Totals	22	5,896

The wells finished in the old Pennsylvania fields each month during 1917 were as follows:—

Month.	Comp.	Prod.	Gas.	Dry.
January	194	520	19	23
February	171	524	22	25
March	204	1,257	17	31
April	235	1,912	25	35
May	234	529	21	35
June	237	708	22	34
July	247	1,107	25	28
August	246	603	33	28
September	215	417	22	32
October	201	448	16	34
November	255	558	25	33
December	141	948	18	15
Totals	2,580	9,531	265	353
For 1916	3,049	10,774	254	305
Difference	469	1,243	11	48

The above wells were distributed for the year in each field as follows:—

Clarion-Venango Fields.

Month.	Comp.	Prod.	Gas.	Dry.
January	64	91	3	6
February	51	69	6	4
March	79	106	2	6
April	78	114	3	7
May	81	98	2	11
June	66	120	2	4
July	75	47	5	6
August	74	143	8	6
September	68	104	5	9
October	59	69	4	12
November	64	81	2	6
December	34	41	2	3
Totals	793	1,083	42	79
For 1916	1,109	1,562	67	80
Difference	316	479	25	1

Southwest Pennsylvania.

Month.	Comp.	Prod.	Gas.	Dry.
January	40	266	8	7
February	44	278	10	12
March	47	940	8	16
April	64	1,578	14	18
May	41	218	6	11
June	58	880	12	17
July	54	823	9	14
August	60	258	14	14
September	44	78	11	15
October	37	138	4	15
November	62	191	17	17
December	36	750	9	7
Totals	587	5,907	122	159
For 1916	605	6,082	111	116
Difference	18	175	11	43

Bradford Field.

Month.	Comp.	Prod.	Gas.	Dry.
January	38	95	1	1
February	30	94	2	1
March	30	94	2	..
April	33	88	1	2
May	40	107	3	1
June	43	115	1	1
July	45	139	2	1
August	48	124	1	..
September	41	134	1	1
October	49	131	..	1
November	42	139	..	..
December	30	80	2	1
Totals	469	1,340	16	10
For 1916	512	1,588	14	10
Difference	43	248	2	..

Middle Field.

Month.	Comp.	Prod.	Gas.	Dry.
January	9	10	1	..
February	19	17	3	3
March	9	14	..	..
April	22	22	3	1
May	28	33	5	4
June	30	35	3	6
July	33	43	4	4
August	22	23	4	3
September	32	54	3	4
October	19	19	4	3
November	46	52	3	5
December	19	49	2	1
Totals	288	371	35	38
For 1916	264	422	8	20
Difference	24	51	27	18

Butler-Armstrong.

Month.	Comp.	Prod.	Gas.	Dry.
January	30	37	5	9
February	19	51	..	5
March	29	69	5	9
April	24	84	4	7
May	20	21	3	7
June	21	27	1	6
July	22	26	2	4
August	23	26	3	5
September	18	30	3	1
October	18	60	2	3
November	23	60	2	4
December	15	15	2	3
Totals	262	496	32	63
For 1916	336	713	46	94
Difference	74	217	14	1

Allegany.

Month.	Comp.	Prod.	Gas.	Dry.
January	13	21	1	..
February	8	15	1	..
March	10	26	..	..
April	14	20	..	..
May	24	52	2	1
June	19	31	3	..
July	18	29	3	..
August	19	29	3	..
September	12	17	1	2
October	19	31	2	..
November	18	45	1	1
December	7	13	1	..
Totals	181	334	18	4
For 1916	223	407	8	15
Difference	42	73	10	11

PENNSYLVANIA GUSHERS.

A few wells in the gusher class were developed in the Pennsylvania fields during the year, meaning oil wells showing 100 barrels or better and gas wells at from 1,000,000 cubic feet up. These wells were confined to the various fields as follows, each month:—

January.

ALLEGHENY COUNTY.

J. E. Leonard & Co., No. 8 McCormick tract, 2,000,000 cubic feet.

Manufacturers' Light and Heat Company, Mallisee tract, 2,000,000 cubic feet.

WASHINGTON COUNTY.

Manufacturers' Light and Heat Company, No. 2 Gallentine tract, 105 barrels of oil.

February.

ALLEGHENY COUNTY.

American Natural Gas Company, No. 2 Thompson tract, 2,000,000 cubic feet.

J. Davis & Co., Schaller tract, 100 barrels of oil.

WASHINGTON COUNTY.

People's Natural Gas Company, No. 6 Scott tract, 125 barrels of oil.

GREENE COUNTY.

Carnegie Gas Company, Riggs tract, 5,000,000 cubic feet.

March.

GREENE COUNTY.

M. P. & M. O. Oil Company, Miller tract, 100 barrels.

Manufacturers' Light and Heat Company, No. 4 Warrick tract, 460 barrels, and No. 2 Modd tract, 380 barrels.

WASHINGTON COUNTY.

Arco Oil Company, No. 4 Watson tract, 100 barrels of oil.

April.

GREENE COUNTY.

Manufacturers' Light and Heat Company, No. 1 Morse tract, 760 barrels, and No. 1 Insminger tract, 210 barrels oil.

People's Natural Gas Company, No. 3 Garrison tract, 2,500,000 cubic feet.

South Penn Oil Company, McCracken tract, 3,000,000 cubic feet.

Philadelphia Company, No. 2 Chaney tract, 4,000,000 cubic feet.

WASHINGTON COUNTY.

Manufacturers' Light and Heat Company, No. 2 Smith tract, 100 barrels oil.

People's Natural Gas Company, No. 7 Scott tract, 100 barrels oil.

ALLEGHENY COUNTY.

American Natural Gas Company, Mt. Royal Cemetery, 3,000,000 cubic feet.

A. Walley, Campbell tract, 2,000,000 cubic feet.

May.

GREENE COUNTY.

Manufacturers' Light and Heat Company, No. 2 Warrick tract, 2,000,000 cubic feet, and No. 1 Wilson tract, 180 barrels oil.

South Penn Oil Company, Morries tract, 9,000,000 cubic feet.

June.

GREENE COUNTY.

Philadelphia Company, Ross tract, 5,000,000 cubic feet.

Manufacturers' Light and Heat Company, No. 2 Strope tract, 141 barrels, and No. 1 W. Miller tract, 275 barrels oil.

ALLEGANY COUNTY.

Walcott Gas Company, Walcott tract, 1,500,000 cubic feet.

ALLEGHENY COUNTY.

Wildwood Oil Company, Ness tract, 125 barrels of oil.

BRADFORD FIELD.

United Natural Gas Company, No. 2,648 Bingham tract, 1,500,000 cubic feet.

MIDDLE FIELD.

Limestone Oil Company, Swab tract, 2,000,000 cubic feet.

BUTLER-ARMSTRONG.

Gerard Oil and Gas Company, No. 2 Christy tract, 1,500,000 cubic feet.

Strance & Co., Stoner tract, 1,000,000 cubic feet.

CLARION COUNTY.

Bartlett & Co., Buckeye tract, 1,500,000 cubic feet.

July.

GREENE COUNTY.

Manufacturers' Light and Heat Company, Warrick tract, 225 barrels of oil, and No. 1 Miller tract, 300 barrels of oil.

City and Suburban Company, Orandorff tract, 2,000,000 cubic feet.

ALLEGHENY COUNTY.

American Natural Gas Company, Myers tract, 3,000,000 cubic feet.

BEAVER COUNTY.

Crescent Oil and Gas Company, Twyford tract, 5,000,000 cubic feet.

August.

GREENE COUNTY.

M. P. & M. O. Oil Company, No. 2 Miller tract, 1,000,000 cubic feet.

Manufacturers' Light and Heat Company, Cooper tract, 5,000,000 cubic feet.

Carnegie Gas Company, Wendt tract, 5,000,000 cubic feet.

WASHINGTON COUNTY.

Natural Gas Company of West Virginia, Carroll and Hixenbaugh tracts, 3,000,000 and 1,000,000 cubic feet.

ALLEGHENY COUNTY.

Manufacturers' Light and Heat Company, No. 2 Lutz tract, 3,000,000 cubic feet.

Rhodes & Co., Boyer tract, 1,000,000 cubic feet.

September.

GREENE COUNTY.

Manufacturers' Light and Heat Company, Insminger tract, 3,000,000 cubic feet.

October.

GREENE COUNTY.

South Penn Oil Company, No. 3 Morris tract, 5,000,000 cubic feet.

ALLEGHENY COUNTY.

Wildwood Oil Company, Gummer Bros. tract, 4,000,000 cubic feet.

VENANGO COUNTY.

S. P. McClamont Estate, Stover tract, 2,000,000 cubic feet.

MIDDLE FIELD.

Triumph Oil and Gas Company, No. 15 Johnson tract, 1,500,000 cubic feet.

BRADFORD FIELD.

South Penn Oil Company, No. 26 Bingham tract, No. 142, 1,500,000 cubic feet.

November.

GREENE COUNTY.

Carnegie Gas Company, No. 2 Kepner, No. 1 Miller, and No. 1 Langdon tracts, 4,000,000, 2,500,000 and 3,000,000 cubic feet.

Philadelphia Company, Thomas and Watson tracts, 3,000,000 and 2,000,000 cubic feet.

Natural Gas Company of West Virginia, Smith tract, 1,000,000 cubic feet.

Manufacturers' Light and Heat Company, No. 2 Insminger tract, 5,000,000 cubic feet, and No. 2 Coklin tract, 2,500,000 cubic feet.

Philadelphia Company, Ordorf and No. 2 Taylor tracts, 2,500,000 and 4,000,000 cubic feet.

ALLEGHENY COUNTY.

Wyland & Co., Wyland tract, 1,000,000 cubic feet.

Schmidt Bros., Schmidt tract, 3,000,000 cubic feet.

JEFFERSON COUNTY.

T. W. Phillips Oil and Gas Company, Campbell tract, 1,500,000 cubic feet.

December.

GREENE COUNTY.

People's Natural Gas Company, Moran tract, 3,000,000, and No. 1 Johnson tract, 2,500,000 cubic feet of gas.

Natural Gas Company of West Virginia, Patterson tract, 3,500,000 cubic feet.

Carnegie Gas Company, No. 3 Wendt tract, 5,000,000 cubic feet.

Manufacturers' Light and Heat Company, No. 4 Strope tract, 385 barrels, and No. 2 Moses tract, 1,250 barrels.

CLARION COUNTY.

Pine Run Coal Company, fee tract, No. 1 and No. 2 same tract, 200 and 100 barrels.

Apollo Gas Company, No. 2 Facemyer tract, 200 barrels.

ALLEGHENY COUNTY.

Horning-Avery & Co., No. 1 McClure tract, 5,000,000 cubic feet.

WEST VIRGINIA.

Fewer Wells and Smaller Production in 1917.

The West Virginia petroleum fields were somewhat slack during 1917, owing to the scarcity of material for drilling purposes, as well as a scarcity in labor and territory to drill. At the start of 1917 it was thought that it would be one of the greatest in the history of the industry for the Little Mountain State, but the failure to open anything in the way of new pools there was no real inducement for the oil men to do much drilling, only in well defined territory, and nothing but small stripping wells can be found there. The only field in the State that has been tested and makes a good showing for future work is the Cabin Creek field, in Kanawha county, where a few of the large operating companies control a vast acreage and these companies are drilling along gradually, although the Ohio Cities Gas Company has been pushing development work on the large acreage known as the Williams Coal Company's tract, where there are still hundreds of locations left to drill, with prospects of wells above the average. The large gas companies have been quite active developing some outside territory, but failed to open up anything new. There is little doubt but what the heavy drain of gas from the West Virginia fields has weakened the pressure to some extent and the companies find it costly and tedious work to find gas enough to supply the trade, as the gas from the State reaches not only in the State in which it is found, but several adjoining States as well. The Pennsylvania and Ohio gas fields are also on the downward grade and to a large extent the West Virginia product is depended upon for the future supply. The opening up of the Kentucky fields may help out to some extent in extending the West Virginia fields in that direction. Both gas and oil have been found in commercial quantities along the Big Sandy River, which is the dividing line between the two States.

There were 158 less wells finished during 1917 than for 1916. The new production was 9,739 barrels less daily. There were one less gas well and 39 less dry holes.

Wells for Year.

The wells for 1917 were distributed through the State by months as follows:

Month.	Comp.	Prod.	Gas.	Dry.
January	133	1,094	35	19
February	142	1,441	49	19
March	141	1,147	49	21
April	139	1,148	48	17
May	135	919	25	21
June	159	1,092	31	26
July	144	1,461	39	29
August	128	1,094	30	27
September	122	1,068	29	21
October	138	1,700	41	17
November	132	1,365	35	21
December	124	1,162	29	19
Totals	1,637	14,711	433	257
For 1916	1,795	24,450	432	296
Difference	158	9,739	1	39

A large number of productive wells are drilled in West Virginia during the year, of both oil and gas. The more important wells are those that produce from 100 barrels and up of oil, or from 1,000,000 cubic feet of natural gas. One of the most important products of West Virginia at this time is natural gas, for many towns and cities in this and adjoining States are depending upon the natural fuel for light and heat during the cold winter season and for cooking and manufacturing plants during the summer season. The gas producing companies are the most active in the State, and keep testing out new territory in a steady hunt for new gas areas, and in this drive usually open up some new and productive oil producing territory; in fact, the gas companies are doing the testing for the oil people to a large extent. These wells were by months, county or district, well owner and production, as follows:—

January.

TYLER COUNTY.

Manufacturers' Light and Heat Company, Bennett, Shaw and Bailey tracts, 2,000,000, 2,000,000 and 1,500,000 cubic feet.

Pittsburgh and West Virginia Gas Company, Davis tract, 3,000,000 cubic feet.

Sun Gas Company, No. 3 Cain heirs tract, 1,500,000 cubic feet.

WETZEL COUNTY.

Manufacturers' Light and Heat Company, Stoneking tract, 2,000,000 cubic feet.

Philadelphia Company, Bartung tract, 2,000,000 cubic feet.

Hope Gas Company, Cove and Bookover tracts, 2,500,000 and 2,000,000 cubic feet.

HARRISON COUNTY.

Hope Gas Company, Nixon, Lyons and Ellis tracts, 2,500,000, 3,000,000 and 2,500,000 cubic feet.

Sun Gas Company, No. 3 Thompson tract, 2,000,000 cubic feet.

DODDRIDGE COUNTY.

Philadelphia Company, Robinson tract, 3,000,000 cubic feet.

Ernest Randolph & Co., Pepper tract, 2,000,000 cubic feet.

Hope Gas Company, Shaughnessy tract, 2,000,000 cubic feet.

RITCHIE COUNTY.

Philadelphia Company, Hall, Markel and Wilson tracts, 2,000,000 cubic feet each.

CALHOUN COUNTY.

G. L. Cabot, Hall, Whipkey and Ball tracts, 2,500,000 cubic feet each.

Hope Gas Company, Polini tract, 1,500,000 cubic feet.

GILMER COUNTY.

Hope Gas Company, Harris tract, 2,000,000 cubic feet.

Philadelphia Company, Hall tract, 1,500,000 cubic feet.

KANAWHA COUNTY.

Clendenning Gas Company, No. 2 Ward heirs tract, 10,000,000 cubic feet.

Raven Carbon Company, Holley tract, 2,000,000 cubic feet.

MARSHALL COUNTY.

Carnegie Gas Company, Fair tract, 4,000,000 cubic feet

MONONGALIA COUNTY.

Hope Gas Company, No. 2 Schriver tract, 2,000,000 cubic feet.

MARION COUNTY.

Hope Gas Company, Cunningham tract, 2,500,000 cubic feet.

BRAXTON COUNTY.

H. A. Harmon, Wildcat tract, 5,000,000 cubic feet.

February.

MARION COUNTY.

Carnegie Gas Company, Carner heirs and Toothman tracts, 2,500,000 cubic feet each.

Delmar Oil Company, No. 29 Hays tract, 2,000,000 cubic feet.

South Penn Oil Company, Reynolds tract, 2,000,000 cubic feet.

Pittsburgh and West Virginia Gas Company, Wilson tract, 2,500,000 cubic feet.

Bonewell & Co., Higginbotham tract, 2,500,000 cubic feet.

Blackshere Oil and Gas Company, Watson tract, 2,500,000 cubic feet.

WETZEL COUNTY.

Carnegie Gas Company, No. 2 Thomas tract, 2,000,000 cubic feet.

Manufacturers' Light and Heat Company, Tegarden tract, 2,000,000 cubic feet.

Philadelphia Company, Cather and Troy tracts, 2,000,000 and 2,500,000 cubic feet.

ROANE COUNTY.

Spring Creek Oil and Gas Company, Sargent tract, 2,000,000 cubic feet.

United Fuel Gas Company, Whitehead and Ingram tracts, 2,000,000 cubic feet each.

KANAWHA COUNTY.

Ohio Fuel Oil Company, Deal tract, 2,000,000 cubic feet, and No. 1 Wright-Halstead tract, 100 barrels of oil.

Columbus Producing Company, No. 60 Williams tract, 100 barrels of oil.

Cabin Creek Gas Company, No. 4 Ward tract, 2,500,000 cubic feet.

DODDRIDGE COUNTY.

Hope Gas Company, W. Nicholson, M. Nicholson and Dennison tracts, 2,500,000, 2,000,000 and 3,000,000 cubic feet.

LEWIS COUNTY.

Reserve Gas Company, Lemaster and Smith tracts, 3,000,000 cubic feet each.

MARSHALL COUNTY.

Carnegie Gas Company, Coll heirs and Fish tracts, 4,000,000 and 3,000,000 cubic feet.

MONONGALIA COUNTY.

Carnegie Gas Company, Devine and Craig tracts, 3,000,000 cubic feet each.

Monongalia Valley Traction Company, Lemaster's tract, 3,000,000 cubic feet.

HARRISON COUNTY.

Hope Gas Company, Post tract, 2,500,000 cubic feet.

Reserve Gas Company, Smith tract, 5,000,000 cubic feet.

RITCHIE COUNTY.

Imperial Oil and Gas Products Company, No. 3 Dotson tract, 2,000,000 cubic feet.

March.

MONONGALIA COUNTY.

Sidney Oil and Gas Company, Hively tract, 2,000,000 cubic feet.

Hope Gas Company, Musgrave tract, 2,500,000 cubic feet.

Philadelphia Company, Cove tract, 2,500,000 cubic feet.

Pittsburgh and West Virginia Gas Company, Cove tract, 3,000,000 cubic feet.

CLAY COUNTY.

United Fuel Gas Company, Samples tract, 1,500,000 cubic feet.

Goff & Heck, No. 4 Hedges tract, 1,500,000 cubic feet.

WETZEL COUNTY.

Hope Gas Company, Lavelle tract, 3,000,000 cubic feet.

Manufacturers' Light and Heat Company, No. 1 Higginbotham tract, and No. 2 Tegarden tract, 3,000,000 cubic feet each.

Erecting "P.I.W." Tanks

P.I.W.
STEEL PLATE CONSTRUCTION

OPERATORS, refiners, and others interested in the petroleum industry have commented many times upon the ease and speed that their field crews attained in erecting "P. I. W." tanks and other "P. I. W." steel plate products.

Independent erectors are enabled to do this because all plates and materials are carefully punched and shaped and plainly marked, and erection instructions are simple and understandable.

This is another factor that has proved the value of "P. I. W." Service to many operators and one which has made "P. I. W." Service world-wide.

The Petroleum Iron Works Co.

SHARON, PA.

NEW YORK PITTSBURGH
ST. LOUIS SAN FRANCISCO

BOTTOM OF TANK ASSEMBLED ON TRESTLES—RIVETING GANG AT WORK.

FIRST RING FITTED UP AND "CRIBBING" BLOCKS IN PLACE.

BOTTOM OF TANK AND FIRST RING COMPLETELY RIVETED AND LOWERED ON FOUNDATIONS.

SECOND RING FITTED UP AND GIRTH SEAM BEING RIVETED.

THIRD RING RAISED AND PARTIALLY RIVETED.

SIXTH RING BEING ASSEMBLED WITH "GIN" POLE USING A "PLATE BUGGY" ON WHICH PLATES ARE ROLLED AROUND TANK TO THEIR PROPER PLACE. ALSO SHOWS THE CONSTRUCTION OF SCAFFOLDING.

STEEL SHELL COMPLETELY ASSEMBLED AND RIVETED WITH TOP ANGLE IRON IN PLACE AND STEEL STAIRWAY IN CONSTRUCTION.

ERECTING GANG ASSEMBLING STRUCTURAL STEEL ROOF SUPPORTS.

ROOF PRACTICALLY COMPLETED AND TANK READY FOR SERVICE.

Carnegie Gas Company, Richmond and Earnshaw tracts, 2,000,000 and 2,500,000 cubic feet.
Philadelphia Company, No. 2 Shriver tract, 1,000,000 cubic feet.

MARION COUNTY.

Carnegie Gas Company, Michaels tract, 2,500,000 cubic feet.
Hope Gas Company, No. 2 Post tract, 3,000,000 cubic feet.

RITCHIE COUNTY.

Carnegie Gas Company, Lamm and Burns tracts, 7,000,000 and 1,500,000 cubic feet.
Philadelphia Company, No. 3 Taylor tract, 2,000,000 cubic feet.
Imperial Oil and Gas Products Company, Nos. 1 and 2 Darnold tract, 2,000,000 cubic feet each.
South Penn Company, No. 8 Lemon tract, 2,000,000 cubic feet.

LEWIS COUNTY.

Reserve Gas Company, No. 4 Camden tract, No. 2 Mertz tract and No. 1 Lavette tract, 2,000,000, 3,500,000 and 3,000,000 cubic feet.
Columbia Carbon Company, No. 4 Egan and No. 6 Lavette tracts, 3,000,000 cubic feet each.
Hope Gas Company, Frost tract, 2,500,000 cubic feet.
West Virginia Central Gas Company, Price tract, 2,500,000 cubic feet.

BRAXTON COUNTY.

Hope Gas Company, Stalkard tract, 2,500,000 cubic feet.

KANAWHA COUNTY.

Falling Rock Cannel Coal Company, No. 1 fee tract, 2,000,000 cubic feet.
Cabin Creek Oil and Gas Company, No. 9 Ward tract, 400 barrels of oil.
United Fuel Gas Company, Ward heirs tract, 250 barrels oil.
Columbus Producing Company, Nos. 68 and 77 Williams tract, 180 and 400 barrels oil.

DODDRIDGE COUNTY.

Hope Gas Company, Maxon and Beverlin tracts, 3,000,000 and 2,000,000 cubic feet.
Salem Natural Gas Company, No. 2 Hickman tract, 2,000,000 cubic feet.
Eastern Petroleum Company, Smith heirs tract, 1,000,000 cubic feet.
J. W. Agnew, No. 2 Roberts tract, 3,000,000 cubic feet.

ROANE COUNTY.

United Fuel Gas Company, Looney tract, 2,000,000 cubic feet.
G. L. Cabot, Gabel tract, 2,000,000 cubic feet.

GILMER COUNTY.

Castle Brook Carbon Company, Norman tract, 2,500,000 cubic feet.
Hope Gas Company, No. 3 Rodenbaugh, and No. 1 Minnie tracts, 2,000,000 cubic feet each.

HARRISON COUNTY.

Reserve Gas Company, Laman tract, 4,000,000 cubic feet.
Clarksburg Light and Heat Company, No. 3 Garrett tract, 2,000,000 cubic feet.
Hope Gas Company, Trash and Cole tracts, 2,000,000 cubic feet each.

MARSHALL COUNTY.

Carnegie Gas Company, Cole heirs tract, 2,500,000 cubic feet.

TYLER COUNTY.

Carter Oil Company, No. 2 Hamilton tract, 6,000,000 cubic feet.
Manufacturers' Light and Heat Company, Bennett tract, 2,500,000 cubic feet.

April.

KANAWHA COUNTY.

Ohio Cities Gas Company, No. 73 Williams tract, 350 barrels oil.
Ohio Fuel Oil Company Ross tract, 2,000,000 cubic feet.
South Penn Oil Company, Bean tract, 6,000,000 cubic feet.

MARION COUNTY.

Carnegie Gas Company, Michaels tract, 2,000,000 cubic feet.
Hope Gas Company, Nitzel tract, 2,500,000 cubic feet.
Carter Oil Company, No. 2 Hays tract, 120 barrels oil.

DODDRIDGE COUNTY.

Keystone Oil Company, Roberts tract, 2,000,000 cubic feet.
Castle Brook Carbon Company, fee tract, 2,000,000 cubic feet.
South Penn Oil Company, No. 2 Cox tract, 2,000,000 cubic feet.
Hope Gas Company, Taylor, Bell and Gaston tracts, 2,500,000 cubic feet each, and No. 1 Tutus tract, 2,000,000 cubic feet.

RITCHIE COUNTY.

Philadelphia Company, Larum tract, 2,500,000 cubic feet.
Hope Gas Company, Fredericks, Waso and Goff tracts, 2,000,000, 2,000,000 and 2,500,000 cubic feet.

WIRT COUNTY.

G. L. Cabot, Brenner tract, 1,500,000 cubic feet.

BRAXTON COUNTY.

G. L. Cabot, Basley tract, 1,000,000 cubic feet.
Philadelphia Company, Bennett tract, 1,500,000 cubic feet.

ROANE COUNTY.

Robertson Oil and Gas Company, Robertson tract, 2,000,000 cubic feet.
Sidney Oil and Gas Company, Walker tract, 1,000,000 cubic feet.
United Fuel Gas Company, Carper, Knight and J. R. Smith tracts, 2,000,000 cubic feet each.

MONONGALIA COUNTY.

South Penn Oil Company, No. 7 Thomas tract, 1,500,000 cubic feet.
Hope Gas Company, Cook tract, 2,000,000 cubic feet.
Home Gas Company, S. Moore and P. W. Moore tracts, 2,500,000 cubic feet each.
Manufacturers' Light and Heat Company, No. 7 Johnstone tract, 1,000,000 cubic feet.
Pittsburgh and West Virginia Gas Company, No. 6 Moore tract, 4,000,000 cubic feet, and No. 1 Eddy and No. 1 Core tract, 3,000,000 cubic feet each.

WETZEL COUNTY.

Carnegie Gas Company, No. 1 Snodgrass tract, 3,000,000 cubic feet, and No. 1 W. G. Snodgrass tract, 2,500,000 cubic feet.
Larimer Oil Company, Hawkins tract, 2,000,000 cubic feet.
Hope Gas Company, No. 1 Cox, No. 2 Tootman and No. 1 Long tract, 2,500,000 cubic feet each.

TYLER COUNTY.

Carter Oil Company, No. 2 Hamilton tract, 2,000,000 cubic feet.

LEWIS COUNTY.

Reserve Gas Company, Camden tract, 3,000,000 cubic feet.
Hope Gas Company, Burton tract, 3,000,000 cubic feet.

HARRISON COUNTY.

Hope Gas Company, No. 1 Edgell tract, No. 2 Edgell tract, No. 1 McDonald tract, and No. 1 Cross tract, 2,500,000, 2,000,000, 3,000,000 and 1,000,000 cubic feet.

GILMER COUNTY.

Engstrom & Co., Norman tract, 2,000,000 cubic feet.

May.

MARION COUNTY.

Hope Gas Company, No. 3 Hamilton tract, 3,000,000 cubic feet.
South Penn Oil Company, No. 7 Murray tract, and No. 1 Millan tract, 2,000,000 cubic feet each.

CALHOUN COUNTY.

Hope Gas Company, Robinson tract, 2,500,000 cubic feet.
G. L. Cabot, No. 4 Ball tract, 2,000,000 cubic feet.

TYLER COUNTY.

Hope Gas Company, Morrow tract, 2,000,000 cubic feet.

WETZEL COUNTY.

Hope Gas Company, No. 4 Merrner tract, 2,500,000 cubic feet.
Wells Oil Company, No. 2 Morgan tract, 2,500,000 cubic feet.
Carnegie Gas Company, No. 3 Earnshaw tract, 2,500,000 cubic feet.

CLAY COUNTY.

Davenport Oil Company, Elk River Coal Company, 2,000,000 cubic feet.

HARRISON COUNTY.

Grasselli Chemical Company, Fairmont tract, 2,500,000 cubic feet.
Horner & Shaffer, No. 2 Martin tract, 2,500,000 cubic feet.
South Penn Oil Company, No. 2 Arnett tract, 2,500,000 cubic feet.
Hope Gas Company, No. 4 Edgell tract, 2,000,000 cubic feet, and No. 1 Williams tract, 2,500,000 cubic feet.

MONONGALIA COUNTY.

Marion Oil Company, No. 2 Lemley tract, 1,000,000 cubic feet.
Hope Gas Company, No. 3 Lemley tract, and No. 1 Cordray tract, 2,000,000 cubic feet each.
Chartiers Oil Company, Wilson tract, 2,000,000 cubic feet.

BRAXTON COUNTY.

Mill Creek Oil and Gas Company, Bourne tract, 2,000,000 cubic feet.

RITCHIE COUNTY.

Pittsburgh and West Virginia Gas Company, McCullough tract, 2,000,000 cubic feet.
Hope Gas Company, No. 2 Motts tract, and No. 1 Horam tract, 2,000,000 and 2,500,000 cubic feet.
Philadelphia Company, Smith, Marsh, S. J. Taylor, Taylor and No. 4 Wilson tracts, 2,000,000 cubic feet each.

MARSHALL COUNTY.

Manufacturers' Light and Heat Company, Fry tract, 2,000,000 cubic feet.

DODDRIDGE COUNTY.

South Penn Oil Company, Sadler tract, 2,500,000 cubic feet.

LEWIS COUNTY.

Philadelphia Company, Timmins tract, 3,000,000 cubic feet.

PLEASANTS COUNTY.

W. A. Clark & Co., Pethel tract, 2,000,000 cubic feet.
E. M. Hall & Co., Osborne tract, 2,000,000 cubic feet.

ROANE COUNTY.

United Fuel Gas Company, Lowther tract, 2,000,000 cubic feet.

June.

MARION COUNTY.

Carnegie Gas Company, No. 2 Snodgrass tract, and No. 5 Morgan heirs' tract, 2,000,000 and 2,500,000 cubic feet.

RITCHIE COUNTY.

Chalmers Oil and Gas Company, No. 5 McGinnis tract, 2,000,000 cubic feet.
Pittsburgh and West Virginia Gas Company, No. 2 McCullough tract, 2,000,000 cubic feet.
South Penn Oil Company, Sheridan-Hardman tract, 2,000,000 cubic feet.
Hope Gas Company, No. 2 Ayres tract, and No. 1 Connelly tract, 3,000,000 and 2,000,000 cubic feet.
Carnegie Gas Company, Jones tract, 2,000,000 cubic feet.
Philadelphia Company, No. 4 Heckman tract, 1,000,000 cubic feet; No. 1 Lantz and No. 2 Lamm tract, 2,000,000 cubic feet each.

CLAY COUNTY.

United Fuel Gas Company, Samples tract, 2,000,000 cubic feet.

WETZEL COUNTY.

Manufacturers' Light and Heat Company, No. 2 Tegarden tract, 3,000,000 cubic feet.
Philadelphia Company, Mertz and Higginbotham tract, 2,000,000 and 2,500,000 cubic feet.

MONONGALIA COUNTY.

South Penn Oil Company, No. 14 Lemley tract, 2,000,000 cubic feet.
Philadelphia Company, M. Tennant tract, 2,000,000 cubic feet.
Pittsburgh and West Virginia Gas Company, Sine tract, 3,000,000 cubic feet.

KANAWHA COUNTY.

South Penn Oil Company, No. 57 Blue Creek tract, 2,500,000 cubic feet.
United Fuel Gas Company, No. 3 Patterson tract, 2,500,000, and No. 5 Sunday Creek Coal Company's tract, 10,000,000 cubic feet.
Ohio Fuel Oil Company, No. 5 Kittinger tract, 125 barrels oil.

PLEASANTS COUNTY.

L. C. White & Co., Riggs tract, 6,000,000 cubic feet.
W. A. Clark & Co., No. 2 Pethel tract, 1,500,000 cubic feet.

LEWIS COUNTY.

Reserve Gas Company, No. 2 Mertz tract, 3,000,000 cubic feet.
Philadelphia Company, Burkhammer tract, 2,000,000 cubic feet.

JACKSON COUNTY.

United Fuel Gas Company, Evans tract, and Harpold tract, 5,000,000 and 2,000,000 cubic feet.

CALHOUN COUNTY.

G. L. Cabot, Penniger tract, 2,000,000 cubic feet.

DODDRIDGE COUNTY.

South Penn Company, Summerville tract, 2,500,000 cubic feet.
Hope Gas Company, Hoskinson, Young and H. Allen tracts, 2,000,000 cubic feet each.

GILMER COUNTY.

Hope Gas Company, No. 3 Bush tract, 2,000,000 cubic feet.
South Penn Company, Brand and Bowman tracts, 4,000,000 and 5,000,000 cubic feet.

HANCOCK COUNTY.

Shady Glenn Oil and Gas Company, Beam tract, 2,000,000 cubic feet.

July.

MONONGALIA COUNTY.

West Virginia Traction Company, Thorn tract, 2,500,000 cubic feet.
South Penn Oil Company, Tennant tract, 3,000,000 cubic feet.
St. Leo Oil and Gas Company, Straight tract, 2,000,000 cubic feet.
South Penn Oil Company, No. 4 Lemley tract, 100 barrels oil.

DODDRIDGE COUNTY.

Philadelphia Company, No. 6 Ballous tract, 2,000,000 cubic feet.
Hope Gas Company, No. 2 Shinn tract, and No. 1 Cox tract, 2,000,000 and 2,500,000 cubic feet.

TYLER COUNTY.

Hope Gas Company, Stephenson tract, 2,000,000 cubic feet.

RITCHIE COUNTY.

Philadelphia Company, No. 3 Taylor tract, 1,500,000 cubic feet.
Carnegie Gas Company, Hoge tract, 2,000,000 cubic feet.

MARSHALL COUNTY.

Carnegie Gas Company, No. 2 Bowers-Walton tract, 3,000,000 cubic feet.

KANAWHA COUNTY.

G. E. Thomas, Bear tract, 9,000,000 cubic feet.
South Penn Oil Company, Chesapeake Mining Company tract, 3,500,000 cubic feet.

ROANE COUNTY.

Depue Gas Company, Depue tract, 2,000,000 cubic feet.
G. L. Cabot, Deems tract, 2,000,000 cubic feet.
United Fuel Gas Company, Lance, Matheney and Young tracts, 2,000,000 cubic feet each.

LINCOLN COUNTY.

South Penn Oil Company, Vickers tract, 5,000,000 cubic feet.

HARRISON COUNTY.

Hope Gas Company, No. 3 Myers tract, 2,000,000 cubic feet, and No. 1 Carder tract, 2,500,000 cubic feet.

LEWIS COUNTY.

Philadelphia Company, McCray and Kempes tracts, 3,000,000 and 2,000,000 cubic feet.
Reserve Gas Company, No. 3 White tract, 2,000,000 cubic feet, and No. 1 G. White tract, and No. 1 Beach tract, 2,500,000 cubic feet each.
Hope Gas Company, Feeney tract, 2,500,000 cubic feet.

BRAXTON COUNTY.

Mann & Beal, Posey tract, 3,000,000 cubic feet.
Philadelphia Company, No. 3 Bourke tract, 2,500,000 cubic feet.

MARION COUNTY.

South Penn Oil Company, Gump tract, 2,500,000 cubic feet.

WETZEL COUNTY.

Philadelphia Company, Higginbotham tract, 2,000,000 cubic feet.

August.

LEWIS COUNTY.

Hope Gas Company, Kempfer tract, 2,500,000 cubic feet; No. 1 Fahey tract, 2,000,000 cubic feet, and No. 1 Cummings-Hall tract, 3,000,000 cubic feet.
Reserve Gas Company, Camden tract, 2,500,000 cubic feet, and No. 1 Norris tract, 2,000,000 cubic feet.
Philadelphia Company, Woofter tract, 2,500,000 cubic feet.

DODDRIDGE COUNTY.

Hope Gas Company, Davidson tract, 3,000,000 cubic feet, and No. 11 Davidson tract, 2,000,000 cubic feet.

HARRISON COUNTY.

Philadelphia Company, Hannah tract, 2,500,000 cubic feet.
Hope Gas Company, Watts heirs' tract, 2,000,000 cubic feet.
Clarksburg Light and Heat Company, Gore tract, 3,000,000 cubic feet.
Carnegie Gas Company, Swiger tract, 2,500,000 cubic feet.
Reserve Gas Company, Paugh tract, 3,000,000 cubic feet.
Pittsburgh and West Virginia Gas Company, Baker tract, 3,000,000 cubic feet.

ROANE COUNTY.

Carter Oil Company, Hedges tract, 1,000,000 cubic feet.
United Fuel Gas Company, No. 3 Whited tract, 2,000,000 cubic feet, and No. 1 Hedges tract, 2,500,000 cubic feet.

GILMER COUNTY.

Hope Gas Company, No. 6 Rymer tract, 2,500,000 cubic feet.

CLAY COUNTY.

United Fuel Gas Company, Brown-Goshorn tract, 2,000,000 cubic feet.

MONONGALIA COUNTY.

Hope Gas Company, Moore tract, 3,000,000 cubic feet.
West Virginia Traction Company, Thomas tract, 3,000,000 cubic feet.
Moon Oil and Gas Company, No. 3 Tennant tract, 2,500,000 cubic feet.

KANAWHA COUNTY.

United Fuel Gas Company, No. 12 Imperial Colliery tract, 135 barrels, and No. 1 Sunday Creek Coal Company tract, 500 barrels oil.

MARION COUNTY.

Blackshere Oil and Gas Company, No. 2 Satterfield tract, 115 barrels oil.
United Fuel Gas Company, No. 5 Campbell tract, 3,000,000 cubic feet.
South Penn Oil Company, Green tract, 2,000,000 cubic feet.
Eastern Petroleum Company, No. 9 Kendall tract, 2,500,000 cubic feet.

WETZEL COUNTY.

Hope Gas Company, Snodgrass tract, 3,000,000 cubic feet.
Philadelphia Company, No. 2 Grimm tract, 2,000,000 cubic feet.

CALHOUN COUNTY.

Martin Crawley, Mitchell tract, 4,000,000 cubic feet.
Hope Gas Company, Johnson tract, 1,000,000 cubic feet.

BRAXTON COUNTY.

Philadelphia Company, Skinner tract, 2,000,000 cubic feet.
Eastern Oil Company, No. 2 Bender tract, 2,000,000 cubic feet.
Mill Fork Oil and Gas Company, No. 5 Bourne tract, 3,000,000 cubic feet.

RITCHIE COUNTY.

Philadelphia Company, Minner, and No. 4 Taylor tract, 2,000,000 cubic feet each.
Hope Gas Company, Perrine tract, 2,000,000 cubic feet, and No. 1 Robinson tract, 2,500,000 cubic feet.
Carnegie Gas Company, No. 2 Lannan tract, 2,000,000 cubic feet.

JACKSON COUNTY.

United Fuel Gas Company, Hoge and Evans tract, 2,000,000 cubic feet each.

MARSHALL COUNTY.

Carnegie Gas Company, No. 2 Williams tract, 3,000,000 cubic feet.

September.

WETZEL COUNTY.

Carnegie Gas Company, Hupp and Bookover tracts, 2,500,000 cubic feet each.
Philadelphia Company, No. 2 Higginbotham tract, 3,500,000 cubic feet; No. 1 Clayton tract, 3,000,000, and No. 1 Higginbotham tract, 1,000,000 cubic feet.

JACKSON COUNTY.

G. L. Cabot, Thomas tract, 2,000,000 cubic feet.

RITCHIE COUNTY.

Imperial Oil and Gas Products Company, No. 6 Darnold tract, 1,000,000 cubic feet.
Philadelphia Company, Neher, and Nos. 1 and 2 Meaner tracts, 1,000,000, 2,000,000 and 2,000,000 cubic feet.
South Penn Oil Company, Hardman tract, 1,000,000 cubic feet.
Carnegie Gas Company, Hodge tract, 2,000,000 cubic feet.

GILMER COUNTY.

Philadelphia Company, Simons tract, 2,000,000 cubic feet.

LINCOLN COUNTY.

Columbia Gas and Electric Company, Huntington Development Company's tract, 3,000,000 cubic feet.

PUTNAM COUNTY.

Sovereign Oil and Gas Company, No. 21 Montgomery tract, 2,000,000 cubic feet.

HARRISON COUNTY.

Hope Gas Company, Green, Carden tracts, 2,000,000 and 2,500,000 cubic feet.

DODDRIDGE COUNTY.

Schlagel & Fried, No. 8 Wells tract, 125 barrels of oil.

TYLER COUNTY.

Schlagel & Fried, No. 8 Wells tract, 125 barrels oil.
Manufacturers' Light and Heat Company, Lemsaters tract, 2,500,000 cubic feet.
Hope Gas Company, Smith-Furbee tract, 1,000,000 cubic feet.

DODDRIDGE COUNTY.

Carter Oil Company, No. 8 Swiger tract, 1,000,000 cubic feet.
Pittsburgh and West Virginia Gas Company, Dotson tract, 2,000,000 cubic feet.
Philadelphia Company, Sherwood tract, 3,000,000 cubic feet.

MONONGALIA COUNTY.

Hope Gas Company, No. 3 Baker tract, 4,000,000 cubic feet.
Monongalia Valley Traction Company, No. 3 Skinner tract, 5,000,000 cubic feet.
West Virginia Traction Company, Thorn tract, 2,000,000 cubic feet.

MARION COUNTY.

South Penn Oil Company, No. 4 Huey tract, 2,500,000 cubic feet.
Philadelphia Company, Mitz tract, 2,000,000 cubic feet.

LEWIS COUNTY.

Philadelphia Company, Hurst tract, 2,500,000 cubic feet.
Reserve Gas Company, No. 2 Fisher tract, 3,000,000 cubic feet.
Hope Gas Company, Kempher tract, 3,000,000 cubic feet.

MARSHALL COMPANY.

Manufacturers' Light and Heat Company, Turner tract, 2,000,000 cubic feet.
Carnegie Gas Company, No. 2 Thill tract, 4,000,000 cubic feet.

October.

KANAWHA COUNTY.

Ohio Cities Gas Company, Nos. 94, 108, 109 and Williams tract, 100, 350, 100 and 275 barrels oil, respectively.
United Fuel Gas Company, No. 2 Sunday Creek tract, 3,000,000 cubic feet.

MARION COUNTY.

Carnegie Gas Company, Phillips tract, 520 barrels oil.
Wildwood Oil Company, No. 5 Campbell tract, 100 barrels oil.
Blackshere Oil and Gas Company, No. 2 Straight tract, 180 barrels oil.
Venture Oil Company, No. 2 Hibbs tract, 3,000,000 cubic feet.
Pentress Gas Company, Cover tract, 2,000,000 cubic feet.
Delmar Oil Company, Gump tract, 3,000,000 cubic feet.
Pittsburgh & West Virginia Gas Company, Davis tract, 2,500,000 cubic tract.
Hope Gas Company, Ice tract, 3,000,000 cubic feet.
South Penn Oil Company, Glover tract, 2,000,000 cubic feet.

HARRISON COUNTY.

Carnegie Gas Company, Robey tract, 100 barrels oil.
Clarksburg Light and Heat Company, Elliott heirs tract, 5,000,000 cubic feet.
Hope Gas Company, Pigott, Sutton, Flowers and Shaw tracts, 3,000,000, 4,000,000, 2,500,000 and 2,500,000 cubic feet, respectively.

LEWIS COUNTY.

Pittsburgh and West Virginia Gas Company, Gaffney heirs tract, 100 barrels oil.
Reserve Gas Company, Flesher, White tracts, 3,000,000 cubic feet each.
Hope Gas Company, No. 2 Khenoweth and No. 2 Cummings-Hall tract, 3,000,000 cubic feet each.

WETZEL COUNTY.

Philadelphia Company, C. Higginbotham tract, 3,000,000 cubic feet.
Manufacturers' Light and Heat Company, Kiger tract, 3,000,000 cubic feet, and No. 3 Tegarden tract produced 3,000,000 cubic feet.
Philadelphia Company, Flannagan and Cosgray tracts, 3,000,000 cubic feet each.
Hope Gas Company, Rice tract, 3,000,000 cubic feet.
Carnegie Gas Company, Morgan tract, 3,000,000 cubic feet.

JACKSON COUNTY.

United Fuel Gas Company, O'Brien tract, and No. 1 Warne tract, 2,000,000 cubic feet each.

RITCHIE COUNTY.

Carnegie Gas Company, Ireland and G. Dodd tracts, 2,500,000 cubic feet each.
Hope Gas Company, Knight tract, 3,000,000 cubic feet. No. 2 Hall tract, 1,000,000 cubic feet.
Philadelphia Company, Hague, Broadwater, Thomas and No. 4 Taylor heirs tracts, 2,000,000, 2,000,000, 4,000,000 and 4,000,000 cubic feet.

GILMER COUNTY.

Hope Gas Company, No. 1 Zuinn and No. 2 Ott tracts, 2,500,000 and 2,000,000 cubic feet.

MONONGALIA COUNTY.

J. H. McDermott Oil Company, No. 4 Price heirs tract, 3,000,000 cubic feet.
West Virginia Traction Company, Tennant tract, 4,000,000 cubic feet.
Hope Gas Company, Lynch tract, 5,000,000 cubic feet.

LINCOLN COUNTY.

C. L. Dickens, No. 3 McComes tract, 3,000,000 cubic feet.

PUTNAM COUNTY.

Big Creek Oil and Gas Company, Grass tract, 2,000,000 cubic feet.

CLAY COUNTY.

United Fuel Gas Company, Brown-Goshorn tract, 2,000,000 cubic feet.

DODDRIDGE COUNTY.

Carter Oil Company, Albers tract, 5,000,000 cubic feet.
Hope Gas Company, Coffman tract, 3,000,000 cubic feet.

MARSHALL COUNTY.

Manufacturers' Light and Heat Company, No. 2 Dorsey tract, 3,000,000 cubic feet.

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PIPE LINES

Healdton, Okla.
Cushing, Okla.

TO

Cushing, Okla.
Wood River, Ills.
(Under Construction)

PRINCIPAL OFFICE

MAYO BUILDING TUSLA OKLAHOMA

Carnegie Gas Company, Nos. 2 and 3 Bowers-Walton tract, 5,000,000 and 2,500,000 cubic feet.

November.

WETZEL COUNTY.

Benedum & Trees, Hawkins tract, 100 barrels oil.

Carnegie Gas Company, Morgan tract, 2,500,000 cubic feet.

Philadelphia Company, Flannagan No. 2, 3,000,000 cubic feet.

Hope Gas Company, No. 2 Edgell, No. 1 Roberts and No. 1 Smith tracts, 3,000,000 cubic feet.

Manufacturers' Light and Heat Company, No. 1 Jolliffe, No. 1 Lantz and No. 2 Thomas tracts, 2,500,000 cubic feet each.

HARRISON COUNTY.

Philadelphia Company, Underwood tract, 2,000,000 cubic feet.

Lamberthport Gas Company, Horner tract, 2,500,000 cubic feet.

Reserve Gas Company, Hudkins tract, 2,000,000 cubic feet.

Hope Gas Company, Wilson, Cornwell and Stout tracts, 3,000,000, 2,000,000 and 2,000,000 cubic feet.

JACKSON COUNTY.

United Fuel Gas Company, Harpold, Warne and Parsons tracts, 2,000,000 cubic feet each, and Starber and Kelley tracts, 2,500,000 cubic feet each.

ROANE COUNTY.

United Fuel Gas Company, Hunsman, Carper, Thomas and Board tracts, 2,000,000, 3,000,000, 2,500,000 and 2,500,000 cubic feet.

Dotty Oil and Gas Company, Dalrymple tract, 2,000,000 cubic feet.

G. L. Cabot, Miller tract, 2,000,000 cubic feet.

Empire Petroleum Company, Schoolcraft tract, 2,000,000 cubic feet.

KANAWHA COUNTY.

Ohio Fuel Oil Company, No. 7 Kittinger tract, 100 barrels of oil.

United Fuel Gas Company, Nos. 17 and 18 Imperial Coal Company's tract, 100 barrels of oil each.

Blackshere Oil and Gas Company, No. 1 Baker heirs tract, 100 barrels of oil.

Kanawha Valley Products Company, Nos. 4 and 5 Bower tract, 3,000,000 cubic feet each.

Cabin Creek Gas Company, No. 11 Ward heirs tract, 2,000,000 cubic feet.

Eastern Carbon Company, Nos. 4 and 5 Thompkins tract, 4,000,000 and 2,000,000 cubic feet.

O'Connell Oil Company, No. 56 Goshorn tract, 5,000,000 cubic feet.

RITCHIE COUNTY.

South Penn Oil Company, Cokerly tract, 2,000,000 cubic feet.

Carnegie Gas Company, Elder tract, 2,000,000 cubic feet.

Cairo Oil Company, No. 4 Prince tract, 2,000,000 cubic feet.

Hope Gas Company, No. 2 Bennett tract, 2,000,000 cubic feet, and No. 1 Broadwater tract, 1,000,000 cubic feet.

Philadelphia Company, Broadwater, Meaner, Cottrell and Wilson tracts, 2,500,000, 1,000,000, 2,000,000 and 2,000,000 cubic feet.

TYLER COUNTY.

Hope Gas Company, Roberts and Baker tracts, 2,500,000 and 2,000,000 cubic feet.

Manufacturers' Light and Heat Company, No. 3 Hought tract, 1,000,000 cubic feet, and No. 1 Sraight tract, 2,000,000 cubic feet.

G. B. McIntyre & Co., McIntyre tract, 2,000,000 cubic feet.

Pittsburgh and West Virginia Gas Company, McCullough tract, 2,000,000 cubic feet.

TAYLOR COUNTY.

Pittsburgh and West Virginia Gas Company, Knight tract, 2,000,000 cubic feet.

Hope Gas Company, Payne tract, 2,000,000 cubic feet.

DODDRIDGE COUNTY.

Carter Oil Company, No. 5 Campbell tract, and No. 2 Freeman tract, 3,000,000 and 2,000,000 cubic feet.

Trainer Bros., Smith tract, 4,000,000 cubic feet.

Hope Gas Company, Nos. 1 and 2 Bates tract, 3,000,000 and 1,000,000 cubic feet.

Carnegie Gas Company, W. G. Smith, S. M. Smith, No. 5 Ash, and No. 1 William Smith tract, 2,000,000, 2,500,000, 3,000,000 and 2,500,000 cubic feet.

CLAY COUNTY.

United Fuel Gas Company, Goshorn-Brown tract, 2,500,000 cubic feet.

Davenport Gas Company, Elk Lumber Company's tract, 2,500,000 cubic feet.

GILMER COUNTY.

Mill Creek Oil and Gas Company, No. 3 Snodgrass tract, 4,000,000 cubic feet.

Hope Gas Company, Lorentz Snodgrass, Wood, Teater heirs, Fisher heirs and Coll tracts, 2,500,000, 1,000,000, 3,000,000, 3,000,000, 2,000,000 and 1,000,000 cubic feet.

LEWIS COUNTY.

Reserve Gas Company, Murray heirs tract, 3,000,000 cubic feet.

Hope Gas Company, McGuire and Gissy tracts, 2,500,000 cubic feet each.

Philadelphia Company, Mazwell, Woofter and McCord tracts, 3,000,000, 2,500,000 and 2,500,000 cubic feet.

MONONGALIA COUNTY.

South Penn Oil Company, No. 7 Fox tract, 3,000,000, and No. 1 McFetter's tract, 1,000,000 cubic feet.

MARION COUNTY.

South Penn Oil Company, No. 4 Baker tract, 2,500,000 cubic feet.

MARSHALL COUNTY.

Manufacturers' Light and Heat Company, Winters tract, 1,000,000 cubic feet.

December.

CALHOUN COUNTY.

Martin Crowley, No. 2 Mitchell tract, 1,000,000 cubic feet.

MONONGALIA COUNTY.

Hope Gas Company, Fox tract, 3,000,000, and No. 5 Cove tract, 1,000,000 cubic feet.

HARRISON COUNTY.

Hope Gas Company, Robinson tract, 2,500,000 cubic feet, and No. 1 McKinley tract, 1,000,000 cubic feet.

West Virginia Central Gas Company, No. 2 Gaston tract, 1,000,000 cubic feet.

Clarksburg Light and Heat Company, Gore tract, 2,500,000 cubic feet.

Reserve Gas Company, Curry tract, 3,000,000 cubic feet.

WETZEL COUNTY.

Carnegie Gas Company, No. 2 Noon tract, 2,500,000 cubic feet.

Philadelphia Gas Company, Haskins tract, 3,000,000 cubic feet.

Hope Gas Company, Wightterman ract, 2,600,000 cubic feet; No. 1 Brush tract, 2,500,000 cubic feet; No. 1 Haines, and No. 1 Newman tracts, 3,000,000 cubic feet each.

Manufacturers' Light and Heat Company, Stewart, Lantz and Thomas tracts, 3,000,000 cubic feet each.

RITCHIE COUNTY.

Philadelphia Company, No. 1 Hickman tract, and No. 5 Cox tract, 2,000,000 cubic feet each.

Hope Gas Company, No. 2 Cox tract, and No. 1 Gornell tract, 2,000,000 cubic feet each.

Carnegie Gas Company, Sinn tract, 1,000,000 cubic feet.

ROANE COUNTY.

G. L. Cabot, Wilson tract, 2,500,000 cubic feet.

United Fuel Gas Company, Steele tract, 2,500,000 cubic feet.

KANAWHA COUNTY.

Cabin Creek Gas Company, No. 7 Ward tract, 2,500,000 cubic feet.

Ohio Cities Gas Company, No. 157 Williams tract, 125 barrels of oil.

MARSHALL COUNTY.

Manufacturers' Light and Heat Company, Winters and Bane tracts, 2,500,000 cubic feet.

Carnegie Gas Company, No. 4 Bowers-Walton tract, 2,500,000 cubic feet.

Manufacturers' Gas and Electric Company, No. 2 Dowler tract, 2,500,000 cubic feet.

LEWIS COUNTY.

Philadelphia Company, Woofter tract, 4,000,000 cubic feet.

BRAXTON COUNTY.

Philadelphia Company, Coberly tract, 3,000,000 cubic feet.

JACKSON COUNTY.

United Fuel Gas Company, Archer and Rodes tracts, 3,000,000 cubic feet each.

TYLER COUNTY.

Pittsburgh and West Virginia Gas Company, McCullough tract, 2,000,000 cubic feet.

Hope Gas Company, McCullough tract, 2,000,000 cubic feet.

CLAY COUNTY.

United Fuel Gas Company, No. 7 Goshorn-Swan tract, 2,500,000 cubic feet.

SOUTHEAST OHIO.

Fewer Completions, Greater New Production.

The Southeastern Ohio petroleum fields did as well as could be expected during 1917, with the high price of material and the cost of the wells in the deep sand fields where the drill must go to depths of from 2,700 to 3,500 feet, and the holes cased from top to bottom with pipe. Second hand 6¼-inch pipe demands about $1.20 per foot and 8¼-inch at $1.50, so that it can be seen that one of these deep holes runs into money rapidly, to say nothing about a standard drilling rig costing close to $1,000. There is still an abundance of territory to drill for oil in the deep sand sections, but the shallow sand fields have been pretty well drilled over. The best producers found in the deep sand fields during the year were found in Muskingum, Hocking, Knox, Washington, Noble, Carroll, and Perry counties.

During 1917 the wells finished in the Southeastern Ohio fields were by months as follows:—

Record of Year.

Month.	Comp.	Prod.	Gas.	Dry.
January	82	712	4	27
February	87	809	6	17
March	106	955	7	31
April	108	1,189	3	20
May	133	1,196	8	41
June	121	939	4	43
July	103	1,262	5	26
August	97	913	10	27
September	118	988	2	35
October	101	591	..	35
November	113	1,045	3	30
December	76	580	3	18
Totals	1,246	11,278	55	356
For 1916.	1,375	9,582	76	411
Difference	129	1,696	21	55

Wells in the select class of 100 barrels or better for oil wells and 1,000,000 cubic feet for gas wells were not very plentiful in the Southeastern Ohio field during the year 1917. In 1913 there were 50 select oil wells; in 1914 there were 42 of them; in 1915 there were 30; in 1916 there were 31, and in 1917 there were 43. These wells, including gas wells, were divided as follows for the year just past—

January.

MUSKINGUM COUNTY.

Edward H. Everett Company, No. 5 O'Bannon tract, 220 barrels.

Ohio Cities Gas Company, No. 4 Madden tract, 100 barrels.

HOCKING COUNTY.

Chartiers Oil Company, No. 116 Hocking Products tract, 105 barrels.

Preston Oil Company, No. 1 Sutton tract, 140 barrels.

KNOX COUNTY.

Forbing Drilling Company, No. 5 Barnes tract, 100 barrels.

February.

HOCKING COUNTY.

Preston Oil Company, No. 1 Hardin tract, 100 barrels, and No. 7 Shaw tract, 205 barrels.

Fisher Oil Company, No. 4 Bryan tract, 115 barrels.

MUSKINGUM COUNTY.

Edward H. Everett Company, No. 7 O'Bannon tract, 195 barrels.

Ohio Cities Gas Company, No. 2 Montgomery tract, 100 barrels.

COLUMBIANA COUNTY.

Boyce Oil Company, No. 3 McGaugh tract, 1,500,000 cubic feet of gas.

WASHINGTON COUNTY.

W. E. Sykes & Co., No. 12 Riggs tract, 160 barrels.

April.

HOCKING COUNTY.

Plymouth Oil and Gas Company, Brian tract, 120 barrels.

Fisher Oil Company, No. 6 Brian tract, 160 barrels.

Chartiers Oil Company, No. 124 Hocking Products tract, 180 barrels.

MUSKINGUM COUNTY.

Ohio Cities Gas Company, No. 5 Madden tract, 225 barrels.

PERRY COUNTY.

Mahalia Oil and Gas Company, Wallace tract, 1,000,000 cubic feet of gas.

May.

HOCKING COUNTY.

Preston Oil Company, No. 11 Terra Cotta tract, 105 barrels.

Cowell, Cochran & Funk, No. 7 Price tract, 200 barrels.

National Fireproofing Company, No. 14 fee tract, 4,500,000 cubic feet of gas, and No. 18, same tract, 1,000,000 cubic feet of gas.

Ohio Fuel Supply Company, Mender tract, 1,500,000 cubic feet of gas.

WASHINGTON COUNTY.

Matamoras Oil and Gas Company, Cordray tract, 1,000,000 cubic feet of gas.

Taylor & Dye, Miller tract, 1,500,000 cubic feet of gas.

C. C. Stover, No. 7 McMahan tract, 100 barrels of oil.

MUSKINGUM COUNTY.

Edward H. Everett Company, No. 13 O'Bannon tract, 200 barrels.

CARROLL COUNTY.

Natural Gas Company of West Virginia, Jewell tract, 1,500,000 cubic feet of gas.

June.

NOBLE COUNTY.

J. T. Lovell & Co., No. 13 Lovell tract, 120 barrels.

MUSKINGUM COUNTY.

Ohio Cities Gas Company, No. 6 Madden tract, 240 barrels.

HOCKING COUNTY.

Mingo Oil Company, No. 2 Tritch tract, 100 barrels.

WASHINGTON COUNTY.

C. C. Stover, No. 8 McMahn tract, 100 barrels.

CARROLL COUNTY.

Leesville Oil and Gas Company, No. 4 Mills tract, 240 barrels.

PERRY COUNTY.

Planet Oil Company, McCann tract, 130 barrels.

July.

LICKING COUNTY.

Ohio Cities Gas Company, No. 4 Loughman tract, 400 barrels.

August.

LAKE COUNTY.

Woolem Mills Company, No. 1 Fee tract, 2,000,000 cubic feet of gas.

MUSKINGUM COUNTY.

Ohio Cities Gas Company, No. 15 Frazier tract, 175 barrels, and No. 17 same tract, 100 barrels.

WASHINGTON COUNTY.

Wickersham & Co., Hutchinson tract, 1,000,000 cubic feet of gas.

Oil City Trust Company, Breckenridge tract, 1,000,000 cubic feet of gas.

HOCKING COUNTY.

Preston Oil Company, No. 9 Shaw tract, 150 barrels.

Limited Oil and Gas Company, Washburn tract, 100 barrels.

HOLMES COUNTY.

Ohio Cities Gas Company, No. 2 Meeks tract, 100 barrels.

JEFFERSON COUNTY.

Mount Zion Oil Company, Maple tract, 1,000,000 cubic feet of gas.

September.

ASHTABULA COUNTY.

Commercial Oil and Gas Company, Fee tract, 3,000,000 cubic feet of gas.

W. & J. Oil and Gas Company, Fee tract, 3,000,000 cubic feet of gas.

MUSKINGUM COUNTY.

Edward H. Everett Company, No. 15 O'Bannon tract, 180 barrels.

October.

HOCKING COUNTY.

Ohio Fuel Supply Company, Menden tract, 100 barrels.

NOBLE COUNTY.

G. C. Best, Jr., No. 12 Beake tract, 100 barrels.

MUSKINGUM COUNTY.

Edward H. Everett Company, No. 16 O'Bannon tract, 130 barrels.

WASHINGTON COUNTY.

Bailey Oil Company, Harris tract, 2,500,000 cubic feet of gas.

November.

HOCKING COUNTY.

Preston Oil Company, Bickel tract, 125 barrels.

Simple Creek Oil Company, McClanahan tract, 140 barrels.

Goodwin Oil Company, Goodwin tract, 375 barrels.

PERRY COUNTY.

Denman Oil Company, No. 2 Nader tract, 130 barrels.

Planet Oil Company, No. 5 Kreager tract, 150 barrels.

CARROLL COUNTY.

Edward H. Everett Company, No. 17 O'Bannon tract, 100 barrels, and No. 18 produced 110 barrels.

December.

LICKING COUNTY.

George Guthrie & Co., Little tract, 1,000,000 cubic feet of gas.

BELMONT COUNTY.

E. J. Gallagher & Co., McKelvey tract, 1,000,000 cubic feet of gas.

CENTRAL OHIO.

Gas Field Record Shows Increased Completions.

The Central Ohio gas field is one of the main spokes in the high grade fields, for its large quantity of gas helps out materially the waning supply of the natural fuel produced in West Virginia. The Clinton sand formation is a rich source of gas, being found at depths varying from 2,300 down to a depth of 3,500 feet, and the deeper down the Clinton sand is found the better the wells' production stays. Possibly four million acres of land are under lease to the leading gas companies operating in the Central Ohio area, and the gas goes to supply fuel and light for many cities of the State as well as manufacturing plants during the summer season, although little is furnished these plants during the winter months. The gas belt covers an area of territory from the shores of Lake Erie on the north to the Ohio River on the south, a distance of fully two hundred miles north and south, and covers a large part of area, close to seventy miles wide, to the east and west. The Clinton sand formation rises rapidly to the west, and in the old Northwestern Ohio field is only a few hundred feet deep, but to reach what is known as the Trenton Rock, in the Central Ohio area, means to drill to a depth of close to 4,200 feet or more. The supposition among gas men is that wonderful wells would be found in the bed of Lake Erie could they be drilled, as the good Ontario gas fields of Canada are straight across the lake from the Central Ohio gas area. In drilling the gas territory the wells are not drilled as close together as in the oil regions, although some town lot development work in a gas way has been done in the past, especially in the Cleveland suburbs where a few years ago one of the best gas fields in the country was developed, but the closeness of the wells together soon pumped the gas sands empty. One well on a 20-acre tract of land is aplenty to get out the gas from under the land, and in many instances but one well is drilled on a 40-acre farm. Some of the large companies that are testing out some of their leased lands are only drilling one test well to a section of land which contains 640 acres, and if the territory is found rich, then other adjoining companies crowd the drilling lines, as is usually the case.

During 1917 there were 582 wells finished in what is known as the Central Ohio area. Of this number 138 were dry holes, 407 were gas wells, and 37 were oil wells with a new oil production of 901 barrels. A record of each month's work in the field during 1917 is as follows:—

Work for the Year.

Month.	Comp.	Wells. Oil.	Prod. Oil.	Gas.	Dry.
Jan.	41	3	55	31	7
Feb.	32	1	10	21	10
March	42	6	46	30	6
April	38	2	20	23	13
May	50	4	54	32	14
June	65	6	295	48	11
July	53	4	148	34	15
Aug.	46	6	187	35	7
Sept.	67	2	40	42	23
Oct.	45	1	25	32	10
Nov.	66	2	31	47	17
Dec.	37	..	..	32	5
Total	582	37	901	407	138
For 1916.	469	36	1,045	322	111
Difference	113	1	144	85	27

Gas Wells Finished Monthly.

The gas wells finished monthly, with the volume of the wells when first drilled in, are as follows:—

Month.	Gas Wells.	Gas Production.
January	31	65,733,400
February	21	32,408,673
March	30	60,235,564
April	23	47,625,815
May	32	60,594,274
June	48	101,141,398
July	34	51,449,030
August	35	39,777,702
September	42	103,783,389
October	32	42,398,502
November	47	104,232,732
December	32	53,998,739
Totals	407	763,379,468
For 1916.	322	593,482,381
Difference	85	169,897,087

How Wells Were Distributed.

The wells for 1917 were distributed by counties as follows:—

Licking County.

Month.	Comp.	Gas.	Dry.
January	5	4	1
February	1	..	1
March	3	2	1
April	1	1	..
May	5	4	1
June	6	4	2
July	2	1	1
August	4	3	1
September	3	2	1
October	4	4	..
November	4	3	1
December	1	1	..
Totals	39	29	10
For 1916.	52	43	9
Difference	13	14	1

Wayne County.

Month.	Comp.	Wells. Oil.	Prod. Oil.	Gas.	Dry.
Jan.	11	..	..	9	2
Feb.	6	..	..	6	..
March	8	1	10	7	..
April	12	1	5	6	5
May	12	2	50	6	4
June	15	4	260	10	1
July	14	3	130	8	3
Aug.	9	1	25	8	..
Sept.	11	1	20	7	3
Oct.	11	5	185	3	3
Nov.	8	..	..	5	3
Dec.	7	..	..	7	..
Totals	124	18	685	82	24
For 1916.	81	1	25	44	16
Difference	63	17	660	38	8

Vinton County.

Month.	Comp.	Wells. Oil.	Prod. Oil.	Gas.	Dry.
Jan.	5	2	10	2	1
Feb.	2	..	..	1	1
March	11	2	10	7	2
April	8	..	..	3	5
May	8	..	..	5	3
June	13	..	..	11	2
July	12	..	..	10	2
Aug.	3	..	..	3	..
Sept.	13	..	..	10	3
Oct.	6	..	..	6	..
Nov.	13	..	..	11	2
Dec.	2	..	..	2	..
Totals	96	4	20	71	21
For 1916.	62	4	45	43	15
Difference	34	..	25	28	6

Cuyahoga County.

Month.	Comp.	Wells. Oil.	Prod. Oil.	Gas.	Dry.
Jan.	3	1	45	2	..
Feb.	2	..	..	2	..
March	7	2	25	5	..
April	4	1	15	3	..
May	6	..	..	3	3
June	4	..	..	3	1

Muskogee Refining Company

A Bird's Eye View of our Refinery at Muskogee, Oklahoma

Refiners of High Grade Oklahoma Petroleum

No. 300 "Dark Western" 600 F. T. Cylinder Stock

No. 305 "Muskogee Green" 600 F. T. Cylinder Stock

Red and Pale Viscous and Non-Viscous Neutral Oils

124-126 M. P. White Crude Scale Wax

Cup, Transmission and Axle Greases

Gasoline, Naphtha and Burning Oil

Gas Oil, Fuel Oil and Distillates

Muskogee Refining Company, Muskogee, Oklahoma
Refinery Department of
Oklahoma Producing and Refining Company

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The Baker Castor Oil Co.

CASTOR OIL

BAKER'S

CRYSTAL
A. A.
No. 3

Largest Producers of Castor Oil in United States

120 Broadway New York

July	5	1	8	3	1
August	5	..	..	4	1
Sept.	6	..	..	3	3
Oct.	4	..	..	3	1
Nov.	7	..	..	6	1
Dec.	5	..	..	5	..
Totals	58	5	93	42	11
For 1916	169	19	395	121	29
Difference	111	14	302	79	18

Medina County.

Month.	Comp.	Wells. Oil.	Prod. Oil.	Gas.	Dry.
Jan.	3	..	..	3	..
Feb.	8	1	10	5	2
March	4	1	1	3	..
April	1	..	..	..	1
May	6	2	4	3	1
June	8	..	..	7	1
July	5	..	..	5	..
August	6	1	2	5	..
Sept.	7	1	20	3	3
Oct.	6	..	..	4	2
Nov.	13	1	6	9	3
Dec.	7	..	..	5	2
Totals	74	7	43	52	15
For 1916	24	3	60	13	8
Difference	50	4	17	39	7

Ashland County.

Month.	Comp.	Gas.	Dry.
January	8	7	1
February	8	4	4
March	7	4	3
April	9	7	2
May	5	4	1
June	10	8	2
July	6	2	4
August	3	2	1
September	7	5	2
October	3	1	2
November	4	2	2
December	3	3	..
Totals	73	49	24
For 1916	67	34	22
Differentce	16	15	2

There was one oil well finished in 1916 good for 10 barrels which equals up the difference in figures.

Richland County.

Month.	Comp.	Gas.	Dry.
January	3	3	..
April	1	1	..
May	3	3	..
June	1	1	..
July	1	1	..
August	4	3	1
September	4	2	2
October	1	1	..
November	4	3	1
December	1	..	1
Totals	23	18	5
For 1916	11	9	2
Difference	12	9	3

Hocking County.

Month.	Comp.	Gas.	Dry.
January	2	..	2
February	1	1	1
March	1	1	..
June	2	2	..
July	2	1	1
August	1	1	..
September	3	3	..
October	2	1	1
November	3	3	..
December	2	2	..
Totals	19	15	4
For 1916	15	3	4
Difference	4	12	..

The Hocking county figures or table does not show that eight oil wells, with a production of 510 barrels, were drilled during 1916, which makes up the difference in the comparison of the two years.

Perry County.

Month.	Comp.	Gas.	Dry.
February	1	1	..
July	1	1	..
August	2	2	..
September	2	2	..
October	2	2	..
November	5	3	2
December	3	3	..
Totals	16	14	2

No wells reported in Jerry county in 1916.

Holmes County.

Month.	Comp.	Wells. Oil.	Prod. Oil.	Gas.	Dry.
June	3	1	25	1	1
Sept.	4	..	..	2	2
Oct.	2	..	..	2	..
Dec.	2	..	..	2	..
Totals	11	1	25	7	3
For 1916	1	..	..	..	1
Difference	10	1	25	7	2

Fairfield County.

Month.	Comp.	Gas.	Dry.
January	1	1	..
February	1	1	..
April	1	1	..
July	2	2	..
June	1	1	..
May	1	1	..
August	3	2	1
September	1	..	1
October	2	1	1
November	1	1	..
Totals	14	11	3
For 1916	5	4	1
Difference	9	7	2

Lorain County.

Month.	Comp.	Gas.	Dry.
January	1	..	1
March	1	1	..
April	1	1	..
July	1	1	..
June	1	1	..
October	2	2	..
Totals	7	6	1
For 1916	5	3	2
Difference	2	3	1

Knox County.

Month.	Comp.	Gas.	Dry.
January	1	..	1
[illegible]	2	1	1
[illegible]	1	..	1
August	1	1	..
September	1	..	1
December	1	1	..
December	2	1	1
Totals	9	4	5
For 1916	5	5	..
Difference	4	1	5

Jackson County.

Month.	Comp.	Gas.	Dry.
July	2	..	2
August	2	2	..
September	3	1	2
October	1	1	..
November	1	..	1
Totals	9	4	5
For 1916	1	..	1
Difference	8	4	4

Coshocton County.

Month.	Comp.	Wells. Oil.	Prod. Oil.	Gas.	Dry.
June	1	..	..	..	1
Sept.	2	..	..	1	1
Oct.	1	..	..	1	..
Nov.	2	1	25	..	1
Dec.	2	..	..	1	1
Totals	8	1	25	3	4
For 1916	1	..	..	..	1
Difference	7	1	25	3	3

RECAPITULATION.

The wells in each county for the year 1917 were as follows:—

County.	Comp.	Oil wells.	Gas.	Dry.
Licking	39	..	29	10
Wayne	124	18	82	24
Vinton	96	4	71	21
Cuyahoga	58	5	42	11
Medina	74	7	52	15
Ashland	73	..	49	24
Richland	23	..	18	5
Hocking	19	..	15	4
Perry	16	..	14	2
Holmes	11	1	7	3
Fairfield	14	..	11	3
Lorain	7	..	6	1
Knox	9	..	4	5
Jackson	9	..	4	5
Marion	2	1	..	1
Coshocton	8	1	3	4
Totals	582	37	407	138
For 1916	469	36	322	111
Difference	113	1	85	27

OIL WELLS AND PRODUCTION.

The total oil wells and production from each county during 1917 were as follows:—

County	Oil Wells.	Oil Prod.
Wayne	18	685
Medina	7	43
Cuyahoga	5	93
Vinton	4	20
Holmes	1	25
Coshocton	1	25
Marion	1	10
Totals	37	901

GAS WELLS AND VOLUME OF GAS.

The gas wells and volume of natural gas for each county during 1917 were as follows:—

County.	Gas Wells.	Volume cubic feet.
Licking	29	12,926,000
Wayne	82	189,013,446
Vinton	71	164,358,000
Medina	52	76,453,233
Cuyahoga	42	100,933,261
Ashland	40	74,126,787
Richland	18	54,421,749
Hocking	15	36,919,555
Perry	14	19,684,308
Holmes	7	14,901,712
Fairfield	11	8,029,400
Lorain	6	6,532,153
Knox	4	2,821,000
Jackson	4	1,859,792
Coshocton	3	399,080
Totals	407	763,379,468
For 1916	322	593,482,381
Difference	85	169,897,087

The Cuyahoga county, or Cleveland district, is holding its own in a development way, and stands third in volume of gas in the new wells for the year, although this field has been one of the most wonderful that has ever been developed in the Central Ohio area. For 1914 and 1915 the work was confined almost entirely to the suburbs of Cleveland, and in 1915 a total of 515 wells was drilled in Cuyahoga county, and the output that year of natural gas for the Central Ohio field amounted to 1,645,066,710 cubic feet for the new wells when they were drilled in, or more than double what the amount is for the year of 1917, indicating that the gas sands are being heavily drawn upon and newer fields are not being unearthed to replenish the fading supply.

Indications are that considerable development work will be done for oil in the counties of Coshocton, Holmes, Hocking, Cuyahoga, Wayne, Lorain and Medina counties during the present year, or as soon as weather conditions are such that work can be done to an advantage. Wayne county, in the vicinity of Wooster, is the choicest spot at this time. Some few years ago a field was opened to the south of Wooster, but since then nothing to speak of has been done in that immediate vicinity in the way of increasing the production. Early in the past year the Ohio Oil Company secured a block of acreage southeast of Wooster and northeast from the old oil development and found a few very nice producing oil wells, and this territory will be taken care of during the coming summer.

In Licking, Knox and Fairfield counties the old gas wells are strong with oil, making the gas almost worthless, and the coming summer should see the drilling of new wells to increase the production of petroleum.

While there is a grand development of oil throughout the Central Ohio area the fact must not be overlooked that natural gas is as important as crude, for thousands upon thousands of people depend upon the product for fuel and light. In years gone by much of this natural fuel was wasted by the burning of large flambeaux throughout the producing sections of the field, but this is a thing of the past and the fuel is conserved by all. Wells years ago that would produce a couple of million cubic feet a day were looked upon as of no real value and many of them were abandoned, but today gas is getting so scarce that a well that will produce a million cubic feet is looked upon as a gusher. Much money is being invested by the large gas concerns in hunting for the natural fuel, and with the high cost of material, labor and everything used in the gas development makes the wells come high. The actual cost is more than double what it was a few years ago, although the price of gas delivered to the homes in the cities and towns have not been advanced.

Oil and Gas Select List.

The gas and oil wells of the Central Ohio field in the select list during the year of 1917 were distributed, by counties and months, as follows:—

January.

LICKING COUNTY.

Columbus Natural Gas Company, No. 2 Irwin tract, 1,000,000 cubic feet.

FAIRFIELD COUNTY.

Ohio Fuel Supply Company, Graves tract, 1,500,000 cubic feet.

ASHLAND COUNTY.

Logan Gas Company, Mang tract, 2,000,000 cubic feet; No. 1 Parr tract, 6,000,000 cubic feet; No. 3 Mohrman tract, 2,000,000 cubic feet, and No. 3 Busler tract, 1,500,000 cubic feet.

Ohio Fuel Supply Company, No. 1 Hissim tract, 4,500,000 cubic feet, and No. 1 Hawks tract, 2,000,000 cubic feet.

MEDINA COUNTY.

Ohio Fuel Supply Company, No. 1 Garman tract, 1,500,000 cubic feet.

Medina Gas and Fuel Company, No. 1 Hanchey tract, 2,000,000 cubic feet.

WAYNE COUNTY.

Logan Gas Company, No. 1 Sellenberger tract, 2,000,000 cubic feet; No. 1 Dennis tract, 3,000,000 cubic feet, and No. 1 Shilling tract, 4,500,000 cubic feet.

Ohio Fuel Supply Company, No. 4 Lingle tract, 8,000,000 cubic feet; No. 1 George tract, 1,000,000 cubic feet, and No. 1 Martin tract, 3,000,000 cubic feet.

Medina Gas and Fuel Company, No. 1 McDermott tract, 1,500,000 cubic feet.

Buckeye State Gas Company, No. 2 Fahr tract, 2,000,000 cubic feet.

RICHLAND COUNTY.

Ohio Fuel Supply Company, No. 1 Weaver tract, 3,000,000 cubic feet.

Logan Gas Company, No. 2 Rowe tract, 6,500,000 cubic feet.

CUYAHOGA COUNTY.

East Ohio Gas Company, No. 1 Ward & Hurt tract, 1,500,000 cubic feet.

Melrose Oil and Gas Company, No. 1 Laughlin tract, 2,000,000 cubic feet.

VINTON COUNTY.

Ohio Fuel Supply Company, No. 1 Waldron tract, 1,500,000 cubic feet.

February.

FAIRFIELD COUNTY.

Ohio Fuel Supply Company, No. 1 Smith tract, 1,750,000 cubic feet.

ASHLAND COUNTY.

Ohio Fuel Supply Company, No. 2 Guthrie tract, 2,500,000 cubic feet, and No. 1 Glasgow tract, 4,000,000 cubic feet.

Logan Gas Company, No. 1 Arnholt tract, 1,000,000 cubic feet.

MEDINA COUNTY.

Logan Gas Company, No. 1 Curtis tract, 1,250,000 cubic feet.

Ohio Fuel Supply Company, No. 1 Vaughn tract, 1,500,000 cubic feet.

Freshwater & Co., No. 1 Ballasch tract, 1,250,000 cubic feet.

WAYNE COUNTY.

Logan Gas Company, No. 2 Sellenberger tract, 2,250,000 cubic feet, and No. 2 Bonawit tract, 2,500,000 cubic feet.

Ohio Fuel Supply Company, No. 5 Lingle tract, 1,250,000 cubic feet.

Medina Gas and Fuel Company, No. 3 Yost tract, 3,000,000 cubic feet.

East Ohio Gas Company, No. 1 Esterday tract, 2,000,000 cubic feet.

CUYAHOGA COUNTY.

Logan Gas Company, No. 1 Stejekal tract, 1,250,000 cubic feet.

VINTON COUNTY.

Ohio Fuel Supply Company, No. 1 Graves tract, 4,500,000 cubic feet.

March.

MEDINA COUNTY.

Medina Gas and Fuel Company, No. 1 German tract, 2,250,000 cubic feet, and No. 1 Martin tract, 1,500,000 cubic feet.

LORAIN COUNTY.

Forest City Stone Company, No. 1 Barrance tract, 1,000,000 cubic feet.

WAYNE COUNTY.

Logan Gas Company, No. 1 Frary tract, and No. 1 Dodd tract, 3,000,000 cubic feet each.

Buckeye State Gas Company, No. 3 Fahr tract, 3,000,000 cubic feet.

Plymouth Oil and Gas Company, No. 1 Boner tract, 1,000,000 cubic feet, and No. 1 Cornell tract, 4,000,000 cubic feet.

James Brikerhoff & Co., No. 1 Armstrong tract, 3,500,000 cubic feet.

CUYAHOGA COUNTY.

East Ohio Gas Company, No. 1 Adams tract, 1,500,000 cubic feet.

Logan Gas Company, No. 1 Bolands tract, 7,000,000 cubic feet.

Rocky River Development Company, No. 1 Mitchell tract, 1,000,000 cubic feet.

Melrose Oil and Gas Company, No. 1 Shubert tract, 2,500,000 cubic feet.

VINTON COUNTY.

Ohio Fuel Supply Company, No. 1 Sampson tract, 3,500,000 cubic feet, and No. 1 Herron tract, 6,250,000 cubic feet.

Richland Oil and Gas Company, No. 1 Martindill tract, 2,500,000 cubic feet.

Central Contract and Finance Company, No. 1 Hardin tract, 2,500,000 cubic feet.

April.

ASHLAND COUNTY.

Logan Gas Company, No. 1 Smith tract, 4,500,000 cubic feet; No. 1 Shaffer tract, 1,500,000 cubic feet, and No. 2 Obrecht tract, 2,000,000 cubic feet.

Ohio Fuel Supply Company, No. 2 Franks tract, 1,000,000 cubic feet.

WAYNE COUNTY.

Logan Gas Company, No. 2 Snyder tract, 1,750,000 cubic feet, and No. 1 Pickard tract, 1,500,000 cubic feet.

Ohio Fuel Supply Company, No. 4 Gearhart tract, and No. 2 Marlin tract, 4,500,000 cubic feet each.

East Ohio Gas Company, No. 1 Bruham tract, 4,500,000 cubic feet.

RICHLAND COUNTY.

Logan Gas Company, No. 1 Applegate tract, 6,500,000 cubic feet.

CUYAHOGA COUNTY.

Logan Gas Company, No. 1 Danford tract, 1,750,000 cubic feet.

Kundtz & Hulse, No. 1 Hall tract, 2,250,000 cubic feet.

VINTON COUNTY.

Ohio Fuel Supply Company, No. 1 Cox & Shockley tract, 3,000,000 cubic feet.

May.

LICKING COUNTY.

Ohio Fuel Supply Company, No. 1 Harris tract, 1,250,000 cubic feet.

FAIRFIELD COUNTY.

Logan Gas Company, No. 1 Daubenmyer tract, 1,500,000 cubic feet.

ASHLAND COUNTY.

Ohio Fuel Supply Company, No. 1 Royer tract, and No. 1 Zimmerman tract, 3,500,000 cubic feet each; No. 1 Strickler tract, 2,250,000 cubic feet.

MEDINA COUNTY.

Logan Gas Company, No. 1 Dealing tract, 2,500,000 cubic feet.

Ohio Fuel Supply Company, No. 1 Branch tract, 1,250,000 cubic feet.

LORAIN COUNTY.

Ohio Fuel Supply Company, No. 1 M. Killip tract, 1,250,000 cubic feet.

WAYNE COUNTY.

Logan Gas Company, No. 2 Miller-Spring tract, 3,000,000 cubic feet, and No. 2 Shilling tract, 6,500,000 cubic feet.

Ohio Fuel Supply Company, No. 1 Ewing tract, and No. 1 Parmenter tract, 2,000,000 cubic feet each.

RICHLAND COUNTY.

Logan Gas Company, No. 1 Oswald tract, 11,750,000 cubic feet, and No. 1 Chew tract, 1,250,000 cubic feet.

CUYAHOGA COUNTY.

East Ohio Gas Company, No. 2 Adams tract, 1,000,000 cubic feet.

Logan Gas Company, No. 1 McGilvary tract, 5,500,000 cubic feet, and No. 1 Tudor tract, 1,750,000 cubic feet.

VINTON COUNTY.

Ohio Fuel Supply Company, No. 1 Blackstone tract, 2,500,000 cubic feet, and No. 1 Reising tract, 2,250,000 cubic feet.

June.

ASHLAND COUNTY.

Logan Gas Company, No. 1 Maurer tract, 1,250,000 cubic feet.

Ohio Fuel Supply Company, No. 1 Cole tract, 2,000,000 cubic feet, and No. 1 McFadden tract, 1,500,000 cubic feet.

MEDINA COUNTY.

Ohio Fuel Supply Company, No. 1 Shildrick tract, 3,000,000 cubic feet; No. 1 Dennis tract, 1,250,000 cubic feet, and No. 1 Huff tract, 2,000,000 cubic feet.

WAYNE COUNTY.

Logan Gas Company, No. 1 Naftzger tract, 2,000,000 cubic feet.

Ohio Fuel Supply Company, No. 1 Barnard tract, and No. 1 Cockrill tract, 3,500,000 cubic feet each, and No. 1 Naftzger tract, 2,500,000 cubic feet.

Ohio Oil Company, No. 1 Whittaker tract, 100 barrels of oil; No. 2 Whittaker tract, 2,000,000, and No. 3 Whittaker tract, 3,000,000 cubic feet of gas; No. 2 Armstrong tract, 2,000,000 cubic feet, and No. 4 Armstrong tract, 2,750,000 cubic feet.

RICHLAND COUNTY.

Logan Gas Company, No. 2 Applegate tract, 5,000,000 cubic feet.

CUYAHOGA COUNTY.

Logan Gas Company, No. 1 Myers tract, 6,500,000 cubic feet.

East Ohio Gas Company, No. 2 Mitchell tract, 2,500,000 cubic feet.

Kundtz & Hulse, No. 1 Zipra tract, 1,250,000 cubic tract.

VINTON COUNTY.

Ohio Fuel Supply Company, No. 1 Poling tract, 2,500,000 cubic feet; No. 1 Maxwell tract, 5,000,000 cubic feet; No. 1 Sowers tract, 2,000,000 cubic feet; No. 2 Herron tract, 8,000,000 cubic feet; No. 1 Lyttle tract, 5,000,000 cubic feet, and No. 1 Reissing & Reese tract, 1,500,000 cubic feet.

Richland Oil and Development Company, No. 2 Martindill tract, 3,000,000 cubic feet.

HOLMES COUNTY.

Logan Gas Company, No. 1 Snively tract, 3,500,000 cubic feet.

July.

ASHLAND COUNTY.

Ohio Fuel Supply Company, No. 1 Baker tract, 1,000,000 cubic feet.

MEDINA COUNTY.

Logan Gas Company, No. 1 Trayry tract, 1,750,000 cubic feet.

Ohio Fuel Supply Company, No. 1 Barnard tract, 2,500,000 cubic feet, and No. 1 Clark tract, 3,000,000 cubic feet.

Medina Gas and Fuel Company, No. 1 Kemp tract, 2,750,000 cubic feet.

LORAIN COUNTY.

Ohio Fuel Supply Company, No. 1 Edward Killip tract, 1,000,000 cubic feet.

WAYNE COUNTY.

Logan Gas Company, No. 3 Miller-Spring tract, 2,000,000 cubic feet, and No. 2 Naftzger tract, 2,250,000 cubic feet.

Medina Gas and Fuel Company, No. 1 Bowman tract, 1,250,000 cubic feet.

Ohio Fuel Supply Company, No. 2 Cockrill tract, and No. 1 Johnson tract, 2,000,000 cubic feet each.

Vanover & Co., No. 1 Walton tract, 1,500,000 cubic feet.

CUYAHOGA COUNTY.

Logan Gas Company, No. 2 Tudor tract, 3,250,000 cubic feet, and No. 2 McGilvary tract, 1,500,000 cubic feet.

VINTON COUNTY.

Ohio Fuel Supply Company, No. 1 Cassell tract, 1,250,000 cubic feet; No. 1 Buskirk tract, 4,500,000 cubic feet; No. 1 Sands tract, 1,000,000 cubic feet; No. 1 Collins tract, 4,500,000 cubic feet; No. 1 Wright tract, 2,000,000 cubic feet, and No. 1 Turner tract, 3,500,000 cubic feet.

Richland Oil and Development Company, No. 3 Martindill tract, 1,500,000 cubic feet.

PERRY COUNTY.

Columbus Natural Gas Company, No. 1 Neil tract, 4,000,000 cubic feet.

August.

MEDINA COUNTY.

Medina Gas and Fuel Company, No. 1 Welpman tract, 1,000,000 cubic feet; No. 1 Kennedy tract, 1,250,000 cubic feet, and No. 1 S. Kennedy tract, 2,500,000 cubic feet.

Ohio Fuel Supply Company, No. 1 Hansel tract, 1,000,000 cubic feet.

WAYNE COUNTY.

Ohio Fuel Supply Company, No. 1 Cummings tract, 4,000,000 cubic feet.

East Ohio Gas Company, No. 1 Vrooman tract, 4,000,000 cubic feet.

RICHLAND COUNTY.

Ohio Fuel Supply Company, No. 1 Berry tract, 1,500,000 cubic feet.

CUYAHOGA COUNTY.

Logan Gas Company, No. 1 Snitzel tract, 6,000,000 cubic feet.

Melrose Oil and Gas Company, No. 1 Miller tract, 3,500,000 cubic feet, and No. 1 Lathrop tract, 2,250,000 cubic feet.

VINTON COUNTY.

Ohio Fuel Supply Company, No. 1 Winters tract, 3,500,000 cubic feet.

PERRY COUNTY.

Logan Gas Company, No. 1 Alspach tract, 1,000,000 cubic feet.

Hulsey Gas Company, No. 1 Culp tract, 1,250,000 cubic feet.

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NEW YORK

EXCLUSIVELY BROKERS

Acids Dyestuffs Chemicals

COALTAR

Primaries Intermediates

September.

KNOX COUNTY.

Ohio Fuel Supply Company, No. 1 Miller tract, 1,000,000 cubic feet.

ASHLAND COUNTY.

Ohio Fuel Supply Company, No. 1 Peterson tract, 1,500,000 cubic feet; No. 1 Black tract, 2,000,000 cubic feet; No. 1 Brenstuhle tract, 4,000,000 cubic feet, and No. 1 Gill tract, 1,750,000 cubic feet.

MEDINA COUNTY.

Ohio Fuel Supply Company, No. 1 Winters tract, 3,000,000 cubic feet.

Medina Gas and Fuel Company, No. 1 Spitzer tract, 1,000,000 cubic feet.

WAYNE COUNTY.

Ohio Fuel Supply Company, No. 1 Armstrong tract, 2,750,000 cubic feet, and No. 5 Gearhart tract, 2,500,000 cubic feet.

Medina Gas and Fuel Company, No. 1 Ault tract, 1,000,000 cubic feet.

East Ohio Gas Company, No. 1 Smetzer tract, 11,000,000 cubic feet, and No. 1 Craig tract, 2,000,000 cubic feet.

RICHLAND COUNTY.

Logan Gas Company, No. 2 Peterson tract, 2,750,000 cubic feet.

CUYAHOGA COUNTY.

Logan Gas Company, No. 1 Standen tract, 1,750,000 cubic feet, and No. 2 Boland tract, 5,500,000 cubic feet.

East Ohio Gas Company, No. 1 Borth tract, 2,500,000 cubic feet.

VINTON COUNTY.

Ohio Fuel Supply Company, No. 1 Gibson tract, 22,000,000 cubic feet; No. 2 Sowers tract, 1,000,000 cubic feet; No. 1 Woltz tract, 5,000,000 cubic feet; No. 1 Henderson tract, 1,250,000 cubic feet; No. 1 Martindill tract, 1,500,000 cubic feet; No. 1 Harper tract, 4,500,000 cubic feet, and No. 2 Sands tract, 1,500,000 cubic feet.

HOLMES COUNTY.

Buckeye State Gas and Fuel Company, No. 1 Garver tract, 1,750,000 cubic feet.

PERRY COUNTY.

Columbus Natural Gas Company, No. 2 Neal tract, 3,000,000 cubic feet.

Heisey Gas Company, No. 1 Roberts tract, 1,500,000 cubic feet.

HOCKING COUNTY.

Ohio Fuel Supply Company, No. 2 Williamson tract, 7,500,000 cubic feet.

October.

LICKING COUNTY.

Heisey Gas Company, No. 1 Gourley tract, 1,000,000 cubic feet.

FAIRFIELD COUNTY.

Ohio Fuel Supply Company, No. 1 Clem tract, 1,500,000 cubic feet.

ASHLAND COUNTY.

Logan Gas Company, No. 2 Maurer tract, 1,750,000 cubic feet.

MEDINA COUNTY.

Medina Gas and Fuel Company, No. 1 House tract, 3,000,000 cubic feet, and No. 2 McDowell tract, 1,750,000 cubic feet.

Ohio Fuel Supply Company, No. 1 Mong tract, 1,000,000 cubic feet.

LORAIN COUNTY.

Ohio Fuel Supply Company, No. 1 Goodwin tract, 1,000,000 cubic feet.

WAYNE COUNTY.

Ohio Fuel Supply Company, No. 1 Wagner tract, 1,000,000 cubic feet, and No. 1 Showalter tract, 2,500,000 cubic feet.

Logan Gas Company, No. 3 Naftzger tract, 1,750,000 cubic feet.

Medina Gas and Fuel Company, No. 1 Peak tract, 1,250,000 cubic feet.

East Ohio Gas Company, No. 1 Blosser tract, 1,500,000 cubic feet.

RICHLAND COUNTY.

Logan Gas Company, No. 1 Oswald tract, 1,250,000 cubic feet.

CUYAHOGA COUNTY.

Melrose Oil and Gas Company, No. 1 Bailey tract, 3,500,000 cubic feet.

Kundtz & Hulse, No. 1 Cipra tract, 1,500,000 cubic feet.

VINTON COUNTY.

Ohio Fuel Supply Company, No. 1 Bethel tract, 2,500,000 cubic feet; No. 1 Edwards tract, 1,750,000 cubic feet; No. 1 Clark tract, 1,250,000 cubic feet, and No. 1 Davis tract, 2,250,000 cubic feet.

Logan Gas Company, No. 1 Stelzer tract, 3,000,000 cubic feet.

November.

MEDINA COUNTY.

Ohio Fuel Supply Company, No. 1 Schaber tract, 1,000,000 cubic feet, and No. 1 Dague tract, 2,000,000 cubic feet.

Logan Gas Company, No. 1 Infirmary tract, 3,500,000 cubic feet.

Medina Gas and Fuel Company, No. 1 Troutman tract, and No. 1 Cole tract, 1,500,000 cubic feet each, and No. 2 Fordham tract, 2,750,000 cubic feet.

WAYNE COUNTY.

Ohio Fuel Supply Company, No. 6 Gearhart tract, 2,000,000 cubic feet, and No. 1 Fetzer tract, 1,500,000 cubic feet.

Medina Gas and Fuel Company, No. 2 Ault tract, 4,500,000 cubic feet, and No. 1 Eddy tract, 8,000,000 cubic feet.

RICHLAND COUNTY.

Logan Gas Company, No. 3 Peterson tract, 6,000,000 cubic feet, and No. 1 Smith tract, 4,000,000 cubic feet.

Ohio Fuel Supply Company, No. 4 Andrews tract, 3,000,000 cubic feet.

CUYAHOGA COUNTY.

Logan Gas Company, No. 1 Wolfe tract, 9,000,000 cubic feet.

Preston Oil Company, No. 1 Pittach tract, 5,500,000 cubic feet.

East Ohio Gas Company, No. 2 Gardner tract, 3,000,000 cubic feet, and No. 1 Doran tract, 3,500,000 cubic feet.

VINTON COUNTY.

Ohio Fuel Supply Company, No. 4 Poling tract, 9,000,000 cubic feet; No. 2 Ramsey tract, and No. 1 Davis tract, 3,000,000 cubic feet each; No. 1 Perivis tract, and No. 1 Winters tract, 2,500,000 cubic feet each; No. 1 Lantz tract, and No. 1 Shoemaker tract, 2,000,000 cubic feet each; No. 1 Stuck tract, 2,500,000 cubic feet, and No. 2 Gibson tract, 1,000,000 cubic feet.

PERRY COUNTY.

Ohio Fuel Supply Company, No. 2 Swick tract, 3,000,000 cubic feet, and No. 1 Boring tract, 1,000,000 cubic feet.

Logan Gas Company, No. 1 Lynn tract, 2,000,000 cubic feet.

HOCKING COUNTY.

Logan Gas Company, No. 4 Tisdall tract, 4,000,000 cubic feet.

Ohio Fuel Supply Company, No. 1 Hardin tract, 3,500,000 cubic feet.

COSHOCTON COUNTY.

Logan Gas Company, No. 1 Reese tract, 100 barrels of oil.

December.

LICKING COUNTY.

Upham Gas Company, Lores tract, 1,000,000 cubic feet.

MEDINA COUNTY.

Medina Gas and Fuel Company, Horton tract, 2,750,000 cubic feet; Mate tract, 2,500,000 cubic feet, and No. 2 Walker tract, 5,000,000 cubic feet.

WAYNE COUNTY.

Logan Gas Company, No. 4 Miller-Spring tract, 2,000,000 cubic feet, and No. 1 Badger tract, 4,000,000 cubic feet.

Ohio Fuel Supply Company, Irvine tract, 1,750,000 cubic feet.

A. B. Hardman & Co., McDonald tract, 2,750,000 cubic feet.

East Ohio Gas Company, Aylesworth tract, 6,000,000 cubic feet.

CUYAHOGA COUNTY.

Melrose Oil and Gas Company, Winslow and Cipra tract, 2,500,000 and 2,000,000 cubic feet.

East Ohio Gas Company, No. 2 Borth tract, 1,000,000 cubic feet, and No. 1 Elliott tract, 2,750,000 cubic feet.

VINTON COUNTY.

Ohio Fuel Supply Company, No. 2 Atwood tract, 2,500,000 cubic feet.

PERRY COUNTY.

Ohio Fuel Supply Company, No. 4 Boring tract, 2,000,000 cubic feet.

HOCKING COUNTY.

Logan Gas Company, No. 4 Tisdall tract, 1,500,000 cubic feet.

Ohio Fuel Supply Company, Karschner tract, 2,000,000 cubic feet.

HOMES COUNTY.

Medina Gas and Fuel Company, No. 2 Hague tract, 3,500,000 cubic feet.

Logan Gas Company, Sprang tract, 2,500,000 cubic feet.

NORTHWEST OHIO.

Decrease Due to Lack of New Territory.

In the petroleum fields of Northwestern Ohio, and known as the Lima Trenton Limestone field, there were 535 wells flunished during the year of 1917, which was a rather large decrease from the work of 1916, due to the inability to extend the old producing areas of the one-time famous field, and the work was confined to the old territory that was practically abandoned some years ago. Out of the 535 wells finished, nine were gas wells, 52 were dry holes, and 474 were oil producing wells with a new combined production of 7,385 barrels a day. Possibly 1917 is the last year of any great importance in the old field, unless by accident an extension is found to the south or a connection between the field and that of Indiana. This intervening territory has not as yet been thoroughly tested out and may yet be linked to the old Indiana fields. No doubt this intervening territory will be more thoroughly tried out this year than ever before, for if the trade wishes to continue work in the field, a new extension must be found. It is remarkable when one tries to count the great number of wells drilled for oil and gas in the entire State of Ohio, that the figures go far above a hundred thousand. Close to 68,000 have been drilled in the Northwestern Ohio division, to say nothing about the many thousands in the Southeastern Ohio fields, also thousands in the Central Ohio fields. Northeastern Ohio has also had some large number of shallow wells drilled years ago for gas. The old wells that have been producing steadily on the power for many years are getting rather light and hardly pays the expense of getting the oil to the tanks, but the average farm owner and operator hates to break away from the old wells, as the chug-chug of the gas engine in pumping the wells is like the songs of the birds to those securing their profits from the wells, and if they were gone the chug of the gas engine would be a thing of the past. Thousands of old wells are being pulled out and the material shipped to Oklahoma, Wyoming, Kansas, Kentucky, and other newer fields, and the well owners are receiving wonderful large prices for the second-hand material.

The wells for the year of 1917 in the Lima field were distributed by months as follows:—

Wells for the Year.

	Comp.	Prod.	Gas.	Dry.
Wood	160	2,259	2	11
Hancock	85	1,305	3	8
Sandusky	63	424	..	2
Mercer	44	486	1	8
Ottawa	41	409	..	2
Seneca	36	1,348	..	6
Auglaize	35	368	3	4
Van Wert	34	417	..	5
Allen	28	335	..	2
Marion	2	20	..	..
Lucas	2	9	..	..
Wyandot	2	6	..	1
Champaign	1	..	..	1
Crawford	1	..	..	1
Darke	1	..	..	1
Totals	535	7,385	9	52
For 1916	699	9,301	10	69
Difference	164	1,916	1	17

Wells by Counties.

The above wells were distributed by the various counties each month during the year.

Wood County.

Month.	Comp.	Prod.	Gas.	Dry.
January	5	75	..	..
February	9	58	..	1
March	20	448	..	3
April	11	286	..	..
May	13	111	1	..
June	14	101	..	2
July	18	277	1	..
August	19	404	..	..
September	17	228	..	2
October	16	141	..	..
November	9	72	..	..
December	9	30	..	3
Totals	160	2,259	2	11
For 1916	239	2,947	3	21
Difference	79	688	1	10

Hancock County.

Month.	Comp.	Prod.	Gas.	Dry.
January	8	84	..	..
February	3	53	..	..
March	3	40	..	..
April	6	176	..	..
May	9	149	1	1
June	11	109	..	1
July	7	79	..	..
August	10	92	2	2
September	6	91	..	2
October	7	75	..	2
November	9	192	..	..
December	6	165	..	..
Totals	85	1,305	3	8
For 1916	114	1,414	3	4
Difference	29	119	..	4

Sandusky County.

Month.	Comp.	Prod.	Gas.	Dry.
January	2	12	..	..
February	2	9	..	..
March	6	39	..	..
April	7	50	..	1
May	8	65	..	..
June	7	38	..	1
July	6	32	..	..
August	9	44	..	..
September	5	50	..	..
October	4	21	..	..
November	5	24	..	..
December	5	40	..	..
Totals	63	424	..	2
For 1916	85	537	1	4
Difference	22	113	1	2

Mercer County.

Month.	Comp.	Prod.	Gas.	Dry.
January	6	113	..	..
February	2	68	..	..
March	4	27	..	1
April	2	3	..	1
May	7	65	..	3
June	4	30	1	..
July	1	9	..	..
August	4	25	..	..
September	4	20	..	2
October	6	85	..	1
November	1	20	..	..
December	3	21	..	..
Totals	44	486	1	8
For 1916	60	1,084	1	7
Difference	16	604	..	1

Ottawa County.

Month.	Comp.	Prod.	Dry.
January	3	36	..
February	6	61	..
March	3	18	..
April	6	80	..
May	5	32	..
June	4	21	..
July	3	25	..
August	3	40	..
September	2	30	..
October	3	10	2
November	2	45	..
December	1	10	..
Totals	41	408	2
For 1916	26	275	..
Difference	15	133	2

Seneca County.

Month.	Comp.	Prod.	Dry.
January	1	30	..
February	2	175	1
March	2	15	1
April	4	235	1
May	3	58	..
June	3	215	..
July	2	40	..
August	6	158	..
September	4	24	1
October	4	155	1
November	4	206	1
December	1	40	..
Totals	36	1,348	6
For 1916	68	1,583	15
Difference	32	235	9

Auglaize County.

Month.	Comp.	Prod.	Gas.	Dry.
January	1	35	..	..
February	1	40	..	..
March	6	39	1	1
April	1	15	..	..
May	2	30	..	..
June	5	47	..	..
July	2	..	2	..
August	3	27	..	1
September	3	57	..	..
October	4	27	..	..
November	5	26	..	2
December	2	25	..	..
Totals	35	368	3	4
For 1916	23	192	..	10
Difference	12	176	3	6

Van Wert County.

Month.	Comp.	Prod.	Dry.
January	1	3	..
February	2	41	1
March	..	..	..
April	2	12	1
May	3	55	..
June	3	65	..
July	3	45	1
August	4	22	2
September	5	58	..
October	3	30	..
November	3	70	..
December	2	10	..
Totals	34	417	5
For 1916	38	800	4
Difference	4	383	1

Allen County.

Month.	Comp.	Prod.	Dry.
January	3	37	..
February	1	10	..
March	3	35	1
April	1	8	..
May	1	10	..
June	3	20	..
July	4	45	1
September	4	50	..
October	4	65	..
November	1	20	..
December	3	35	..
Totals	28	335	2
For 1916	37	430	2
Difference	11	95	..

Marion County.

Month.	Comp.	Prod.	Dry.
February	1	10	..
June	1	10	..
Totals	2	20	..

Lucas County.

Month.	Comp.	Prod.	Dry.
January	1	2	..
May	1	7	..
Totals	2	9	..
For 1916	6	39	..
Difference	3	30	..

Wyandot County.

Month.	Comp.	Prod.	Dry.
August	1	..	1
October	1	6	..
Totals	2	6	1
For 1916	1	..	1
Difference	1	6	..

Champaign County.

Month.	Comp.	Prod.	Dry.
April	1	..	1

Crawford County.

Month.	Comp.	Prod.	Gas.	Dry.
May	1	..	..	1
Totals	1	..	..	1
For 1916	1	..	1	..
Difference	..	..	1	1

Darke County.

Month.	Comp.	Prod.	Dry.
May	1	..	1

ABANDONED WELLS.

In the year of 1917 there were 1,259 old wells abandoned and pulled out in the fields of Northwestern Ohio, as the wells were in some instances exhausted of their fluid, while others were abandoned to dispose of the casing and other material at the high prices that prevailed during the year. The wells were by months as follows:—

Month.	Abandoned.
January	17
February	11
March	57
April	86
May	201
June	147
July	93
August	156
September	176
October	69
November	131
December	115
Total	1,259
For 1916	657
Difference	602

The above abandoned wells were listributed among the various counties of Northwestern Ohio as follows:—

County.	Abandoned.
Sandusky	250
Wood	220
Mercer	167
Allen	165
Van Wert	154
Hancock	145
Ottawa	83
Lucas	37
Auglaize	24
Wyandot	8
Putnam	5
Darke	1
Total	1,259

WELLS OF 100 OR MORE BARRELS.

The wells of 100 barrels or more in the Northwestern Ohio fields were distributed as follows:—

Seneca County.

FEBRUARY.

Sun Company, No. 6 Pittinger tract, 175 barrels.

APRIL.

Sun Company, No. 15 Orphans' Home tract, 100 barrels.

OCTOBER.

Sun Company, No. 10 E. Randall tract, 125 barrels.

NOVEMBER.

Sun Company, No. 2 Einsel tract, 250 barrels.

Wood County.

MARCH.

Ohio Oil Company, No. 25 Powell tract, 225 barrels.

APRIL.

D. S. Brown, No. 2 Brown tract, 100 barrels.

AUGUST.

Grant Mays & Co., No. 4 Morrisey tract, 100 barrels.

Cleveland Fuel Oil Company, No. 5 Hoodlebrink tract, 100 barrels.

OCTOBER.

Harris & Welch, No. 4 Langmade tract, 100 barrels.

Hancock County.

APRIL.

Ohio Oil Company, No. 47 Alexander tract, 100 barrels.

NOVEMBER.

Ohio Oil Company, No. 24 Trout tract, 165 barrels.

DECEMBER.

Ohio Oil Company, No. 25 Trout tract, 100 barrels.

INDIANA.

Same Number of Wells, Increased Production.

There were the same number of wells finished in the Indiana fields during 1917 as in 1916. Of this number 76 were located in the old Trenton Limestone field, in the eastern part of the State and 191 were finished in the western section of the State, close to the Illinois field. There were no real features in any of the development with the exception of the well found in the Fort Wayne field, in the southern part of Allen county, which is an extension to the Geneva field to the north. Some fair sized wells were found in the old development in the vicinity of Camden in Jay county, where years ago numerous gushers were drilled in. The wells for 1917 were drilled by months as follows:—

Wells by Months.

Month.	Comp.	Prod.	Gas.	Dry.
January	11	173	1	4
February	11	166	2	3
March	15	281	..	1
April	20	303	..	7
May	21	432	1	9
June	25	546	1	9
July	29	493	..	11
August	22	344	2	7
September	20	453	..	6
October	39	767	..	10
November	31	450	2	9

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MURIATE OF POTASH

AMMONIUM BORATE **BORAX GLASS**

BORATE OF MANGANESE

BORAX

Crystals
Powdered
Granulated
Impalpable
Calcined

20 MULE TEAM BRAND

Refined and U. S. P.

BORIC ACID

Crystals
Powdered
Granulated
Impalpable
Anhydrous

PACIFIC COAST BORAX COMPANY

NEW YORK CHICAGO OAKLAND

December	23	591	..	8
Totals	267	4,919	9	84
For 1916.....	267	3,554	8	98
Difference		1,365	1	14

The above wells were distributed by months during the year in each county as follows:—

Pike County.

Month.	Comp.	Prod.	Gas.	Dry.
January	5	93	..	2
February	6	61	2	1
March	8	102	..	1
April	7	100	..	2
May	10	91	1	4
June	7	120	..	2
July	10	295	..	2
August	9	226	1	1
September	11	173	..	3
October	12	186	..	1
November	7	86	..	1
December	11	138	..	4
Totals	103	1,671	4	24
For 1916.....	70	872	3	28
Difference ...	33	799	1	4

Sullivan County.

Month.	Comp.	Prod.	Gas.	Dry.
January	1	..	..	1
February	4	30	..	2
March	3	56	..	..
April	2	4	..	1
May	4	87	..	2
June	3	30	..	1
July	5	30	..	2
August	2	..	..	2
September	4	50	..	2
October	7	325	..	2
November	10	117	..	2
December	7	238	..	2
Totals	52	967	..	19
For 1916	132	1,862	4	49
Difference ...	80	895	4	30

Jay County.

Month.	Comp.	Prod.	Dry.
January	2	15	1
March	4	123	..
April	2	15	1
May	3	..	3
June	6	220	3
July	6	40	5
August	1	40	..
October	7	70	2
November	6	..	6
December	1	60	..
Totals	38	583	21
For 1916	4	145	2
Difference	34	438	19

Gibson County.

Month.	Comp.	Prod.	Gas.	Dry.
January	1	..	1	..
February	1	15	..	..
April	2	91	..	..
May	1	60	..	..
June	6	175	1	1
July	3	50	..	2
August	5	55	1	2
September	4	220	..	1
October	3	90	..	1
November	5	140	2	..
December	2	155	..	..
Totals	33	1,051	5	7
For 1916.....	19	155	..	5
Difference ...	14	896	5	2

Miami County.

Month.	Comp.	Prod.	Dry.
January	1	5	..
April	3	88	..
July	2	6	..
August	3	3	1
October	5	12	2
November	1	2	..
Totals	15	116	3
For 1916.....	10	87	4
Difference	5	29	1

Allen County.

Month.	Comp.	Prod.	Dry.
April	1	5	..
May	2	119	..
July	2	70	..
September	1	10	..
November	2	85	..
Totals	8	289	..
For 1916.....	1	..	1
Difference	7	289	1

Randolph County.

Month.	Comp.	Prod.	Dry.
April	1	..	1
June	1	..	1
August	1	20	..
December	1	..	1
Totals	4	20	3
For 1916.....	3	150	2
Difference	1	130	1

Knox County.

Month.	Comp.	Prod.	Dry.
January	1	60	..
May	1	75	..
August	1	..	1
Totals	3	135	1

Delaware County.

October	2	75	1
December	1	..	1
Totals	3	75	2
For 1916.....	1	5	..
Difference	2	70	2

Grant County.

Month.	Comp.	Prod.	Dry.
June	1	1	..
July	1	2	..
October	1	4	..
Totals	3	7	..
For 1916.....	3	23	..
Difference	..	16	..

Huntington County.

Month.	Comp.	Prod.	Dry.
October	1	..	1

Blackford County.

Month.	Comp.	Prod.	Dry.
June	1	..	1
October	1	5	..
Totals	2	5	1
For 1916.....	6	35	3
Difference	4	30	2

Madison County.

Month.	Comp.	Prod.	Dry.
April	1	..	1

Wabash County.

Month.	Comp.	Prod.	Dry.
April	1	..	1

No wells were finished during 1917 in Wells, Vigo, Warrick or Daviess counties. No wells of 100 barrels or better were drilled in Indiana during the year.

Wells Finished in Each County.

The wells finished in each county for the year were as follows:—

County.	Comp.	Prod.	Gas.	Dry.
Pike	103	1,671	4	24
Sullivan	52	967	..	19
Jay	38	583	..	21
Gibson	33	1,051	5	7
Miami	15	116	..	3
Allen	8	289	..	..
Randolph	4	20	..	3
Knox	3	135	..	1
Delaware	3	75	..	2
Grant	3	7	..	..
Huntington ...	1	..	..	1
Blackford	2	5	..	1
Madison	1	..	..	1
Wabash	1	..	..	1
Totals	267	4,919	9	84

ABANDONED WELLS.

The abandoned wells which are worthless for pumping purposes further, or the material is worth more than the oil produced, have been pulled out each month for 1917 as follows:—

Month.	Abandoned.
January	72
February	14
March	123
April	100
May	49
June	148
July	87
August	116
September	112
October	72
November	51
December	72
Total	966
For 1916.....	518
Difference	448

The above wells were distributed among the various counties as follows:—

County.	Abandoned.
Jay	342
Grant	203
Adams	169
Wells	133
Huntington	53
Pike	26
Blackford	18
Delaware	14
Gibson	8
Total	966

ILLINOIS.

Wells and Production Drop Over 50 Per Cent.

The Illinois field in the way of new work finished for the year of 1917 was looked upon somewhat as a failure as this field has been a most remarkable one for its work and production, but the year just closed indicates that the field has seen its best days and will now go backward at a rapid clip. There were but 645 wells finished against 1,459 for the previous year. The State has not a very bright prospect for the future in its oil end, and will no doubt be very quiet from now on, unless something new is found in the way of prolific pools yet unheard of. There are still locations to drill in many of the counties, but outside of Lawrence county, in what is known as the deep sand fields, little pumpers are the best that can be expected. Lawrence county may yet develop some fairly good production, owing to the many producing sands that are found in drilling a 2,000 foot hole. The county is known to have close to a dozen pay sands and is more like the California field on that score than any other. The one remarkable feature of the Illinois field is the excellent staying qualities of the wells already drilled and there is no field in the country that does stay any better.

The wells finished during 1917 were distributed by months as follows:—

Wells for the Year.

Month.	Comp.	Prod.	Gas.	Dry.
January	66	1,165	..	14
February	46	790	1	16
March	39	394	..	13
April	54	694	1	13
May	64	1,020	2	13
June	60	1,161	..	11
July	73	861	1	15
August	73	1,437	..	15
September	47	1,091	2	9
October	48	672	1	8
November	41	500	..	9
December	34	354	..	11
Totals	645	10,148	8	150
For 1916.....	1,459	24,713	36	317
Difference ...	814	14,565	28	167

Wells by Months.

The above wells were finished by counties each month during the year as follows:—

Crawford County.

Month.	Comp.	Prod.	Gas.	Dry.
January	25	469	..	4
February	26	499	1	8
March	20	210	..	4
April	26	266	1	6
May	28	325	2	7
June	25	249	..	6
July	26	201	1	8
August	31	311	..	11
September .. .	13	154	1	2
October	19	116	1	5
November	19	158	..	5
December	18	145	..	5
Totals	276	3,103	7	71
For 1916	568	6,071	26	151
Difference ...	292	2,968	19	80

Clark County.

Month.	Comp.	Prod.	Dry.
January	7	51	..
February	8	61	2
March	4	51	2
April	11	81	2
May	11	153	1
June	16	134	2
July	18	224	4
August	24	277	2
September	10	168	1
October	15	201	..
November	8	38	2
December	4	10	2
Totals	136	1,449	21
For 1916.....	256	3,749	36
Difference	120	2,300	15

There were four gas wells finished in this county during 1916, but none in 1917.

Lawrence County.

Month.	Comp.	Prod.	Dry.
January	18	307	5
February	11	230	5
March	5	110	..
April	8	217	2
May	11	488	..
June	13	685	1
July	13	365	1
August	11	579	..
September	18	605	3
October	8	348	..
November	10	271	..
December	7	92	2
Totals	133	4,297	19
For 1916.....	246	9,540	33
Difference	113	5,243	14

Note.—One gas well was drilled in September, 1917, in Lawrence county.

Wabash County.

Month.	Comp.	Prod.	Dry.
January	4	295	1
February	1	..	1
March	3	..	3
April	3	75	2
May	1	..	1
June	3	75	2
July	2	35	1
August	2	260	..
September	3	160	1
October	1	..	1
November	3	40	1
December	2	100	1
Totals	28	1,040	15
For 1916.....	29	2,325	12
Difference	1	1,285	3

Cumberland County.

Month.	Comp.	Prod.	Dry.
January	3	18	..
March	2	13	..
April	4	50	..
May	7	34	..
July	7	23	1
August	1	4	..
October	2	6	..
Totals	26	148	1
For 1916.....	40	434	3
Difference	14	286	2

There were three gas wells finished in Cumberland county in 1916.

McDonough County.

Month.	Comp.	Prod.	Dry.
January	4	10	2
April	1	5	..
May	1	5	..
June	2	3	..
July	4	8	1
August	1	2	..
September	1	4	..
October	1	..	1
November	1	2	..
December	2	7	..
Totals	18	46	4
For 1916.....	210	1,855	25
Difference	192	1,809	21

Clinton County.

Month.	Comp.	Prod.	Dry.
March	1	10	..
May	2	..	2
July	1	..	1
August	1	..	1
September	2	..	2
October	1	..	1
December	1	..	1
Totals	8	10	7
For 1916.....	33	291	22
Difference	25	281	15

Marion County.

Month.	Comp.	Prod.	Dry.
March	1	..	1
April	1	..	1
May	2	..	2
July	1	..	1
August	1	..	1
Totals	6	..	6
For 1916.....	26	217	8
Difference	20	217	2

Edgar County.

Month.	Comp.	Prod.
May	1	15
June	1	15
July	1	5
August	1	4
October	1	1
Totals	5	40

Hancock County.

Month.	Comp.	Prod.	Dry.
January	4	15	1
For 1916.....	23	167	10
Difference	19	152	9

Other Counties.

Two dry holes were drilled in Saline county, and one each in Coles and Perry counties. No wells were finished in 1917 in Macoupin, Henderson, Bond, Brown, Schuyler and Coles counties.

Abandoned Wells.

The wells abandoned or pulled out in Illinois for 1917 were, by counties, as follows:—

County.	Abandoned.
Crawford	63
Lawrence	94
Clark	22
Marion	11
Wabash	5
Clinton	5
Total	200

GUSHERS FOR 1917.

The Illinois gushers for 1917 were, by months and counties, as follows:—

January.

CRAWFORD COUNTY.

Ohio Oil Company, No. 10 Petty tract, 100 barrels.

LAWRENCE COUNTY.

Ohio Oil Company, No. 19 H. H. Gould tract, 130 barrels.

WABASH COUNTY.

Allendale Oil Company, Nos. 7 and 8 Coulter tract, 125 and 150 barrels.

February.

CRAWFORD COUNTY.

Associated Producers' Company, No. 3 Barrick tract, 100 barrels.

H. C. Ferriman, No. 2 Coulter tract, 100 barrels.

April.

CRAWFORD COUNTY.

McMasters & Co., No. 1 Culp tract, 100 barrels.

May.

CRAWFORD COUNTY.

Toomey & McGuigan, No. 8 Walters tract, 100 barrels.

LAWRENCE COUNTY.

Maple Oil and Gas Company, No. 11 Jones tract, 125 barrels.

June.

CRAWFORD COUNTY.

Watson, Potts & Co., No. 15 Newlin tract, 150 barrels.

LAWRENCE COUNTY.

Ohio Oil Company, No. 9 Judy tract, and No. 38 Robbins tract, 100 barrels each.

July.

CLARK COUNTY.

Ohio Oil Company, No. 106 Young tract, 150 barrels.

Ohio Oil Company, No. 7 Clay Seed tract, 100 barrels.

August.

LAWRENCE COUNTY.

Ohio Oil Company, No. 39 Robbins tract, 225 barrels, and No. 13 Williams tract, 130 barrels.

WABASH COUNTY.

Sian Oil and Gas Company, No. 10 Smith tract, 125 barrels.

Associated Producers' Company, No. 6 Buchanan tract, 135 barrels.

September.

LAWRENCE COUNTY.

Ohio Oil Company, No. 7 Ackerman tract, 135 barrels, and No. 16 R. G. Gillespie tract, 100 barrels.

Allendale Oil Company, No. 11 Coulter tract, 110 barrels.

October.

LAWRENCE COUNTY.

Ohio Oil Company, No. 25 Jos. Gray tract, 140 barrels.

December.

WABASH COUNTY.

Associated Producers' Company, No. 7 Buchanan tract, 100 barrels.

BANNER YEAR IN KENTUCKY DUE IN 1918: LARGE OPERATING COMPANIES BUY ACREAGE

Big Increase in Both Completed Wells and New Production During Year Closed.

The production of petroleum is by no means a new thing to Kentucky, as history teaches, but it was not until the present year that the State made a showing that attracted the oil trade from far and wide to within its borders, and for that reason millions of dollars were invested in production and leases during 1917, which up to this time has been the banner oil year of the State. The first well to be drilled that found oil on the American continent was drilled within the borders of Kentucky. This well was known as The American Well, and is situated three miles above Burkesville, on the bank of the Cumberland River. About the year of 1829, while some men were engaged in drilling or boring, as it was called in those days, for salt water, and after penetrating about 175 feet through a solid rock formation, they struck a vein of oil, which suddenly spouted up to a great height for several days. The oil that came from the hole in the ground ran into the Cumberland River, covering the surface of the water for many miles down stream. It was readily supposed to be inflammable, and upon being ignited it presented the novel and magnificent spectacle of a river on fire, the flames literally covering the whole surface for miles, reaching to the top of the tallest trees on the banks of the river, and continued burning until the supply of oil was exhausted.

The salt borers were greatly disappointed, and the well was neglected for several years, until it was discovered that the oil possessed valuable medical qualities, after which it was bottled up in large quantities, and was extensively sold in nearly all the States of the Union. Since then fortunes have been made and lost in the development of Kentucky. Along about 1903 the famous Sue Jones well was drilled near or between Mill Springs and Monticello, in Wayne county, and for at least three years there was a real oil boom, and much money was made among those that were lucky enough to hold inside stuff. From the drop of the Jones pool there was little done until a few years ago, when Dulin and others from Indiana went into Estill

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county, near Irvine, and drilled a test on the large Maple tract, securing a nice well, which was followed by others. When the Irvine field was opened the average oil man was still afraid of Kentucky and feared to invest any money in it, but the field became so prominent that the largest operating companies in the world concluded that the shallow drilling, with the high cost of material, would be a wise move, and they, along with the little fellows, broke for the field, with the result that today the Kentucky field is one of the bright spots of the high grade fields.

The Irvine field has spread over a vast area of territory and development work has been going on with exceptionally good results in all the counties adjoining Estill. Just at this time there are other counties that look just as inviting as Estill and are all making good. They are Lee, Powell, and Wolfe counties. Powell, Lee, and Wolfe counties are now the best looking spots for development work in the Irvine or east end field. One of the coming important fields of the State lies in the western central portion in Allen and Warren counties. Allen county has been producing some oil for a number of years, but 1916 and 1917 were its greatest seasons. Up to within a few months, the production of Allen county has been confined to the south half of Allen county, but now things have changed, and the northern half is showing much the better, as two wells, in what is known as the Gainesville section of the country, have brought about a rush for that section, which lies close up the Warren county line. West of Bowling Green, in Warren county, several wells have been drilled that show a quantity of oil at a depth of about 1,200 feet. An anticline passes through Warren, Allen, and across the Tennessee border into Macon county, of the last named State, and on this anticline is now the spot where the great activity will rage in the 1918 season. Southeast of Bowling Green some nine miles, the Sullivan-Nickell crowd, of Kansas City, found a nice pumper on the Larmon tract, and the Walmer Oil Company has a well which makes a good showing on the Bates tract, also a nice gas well on the Kirby tract, going to show that there is no doubt a producing field of prominence between Bowling Green and Scottsville, and, were it not for the bad winter weather that prevails in that country, this vast area of territory would now show half a hundred drilling wells.

500 Wells by July 1, 1918.

Fairly good showings of oil were found during 1917 in many counties of the State, and with the advent of summer these showings will be tested out by additional drilling. If conditions are right and the machines can be secured, it is predicted that over five hundred wells will be drilling in Kentucky before the first of July.

Many large properties have been sold in Kentucky during the past year and many thousands of acres of leases have changed hands at exceedingly good prices. Most of it has been sold to the large operating companies that can well afford to test out the wildcat territory, and they cough up a nice sum for producing wells, as well. Negotiations are now pending for the sale of numerous properties to the large concerns. The Cumberland Pipe Line Company has made some extensions during the year of its gathering lines and will continue adding to them as fast as newer fields are opened up in the Irvine vicinity. Up to this time the second best field in the State has no pipe line market for its crude, which is the Scottsville-Bowling section, but the coming spring will see a market for the output of the field, in either a refinery with gathering lines or the oil will be shipped by tank cars and barges, the Barren River being navigable to the Ohio River from Bowling Green, and the fact that the Security Producers and Refiners Company, having a large refining plant at Louisville, contemplates the laying of a line through the field and shipping the oil by boat to the refinery. Anderson T. Herd, the New York capitalist, has organized the Anderson T. Herd Refining Company and expects to put in a refinery at or near Scottsville. The Pioneer Refining Company contemplates the construction of a small plant near Petroleum, south of Scottsville, in Allen county. There is a small refinery at Nashville that secures its oil from the Allen county field.

The list of wells drilled in each county of Kentucky for a year will give a good idea of the vast amount of wildcat work that has been done.

Work for the Year.

A summary of monthly completed work in the Kentucky field for the year is as follows:—

Month.	Comp.	Prod.	Gas.	Dry.
January	100	2,918	2	22
February	105	4,596	4	23
March	118	4,259	3	27
April	108	3,978	4	23
May	161	5,572	1	37
June	163	1,606	2	54
July	123	1,546	3	44
August	166	1,962	9	49
September	136	2,573	8	23
October	175	2,702	8	34
November	156	1,961	9	41
December	142	1,541	8	45
Totals	1,648	35,204	61	422
For 1916	1,071	26,973	16	179
Difference	577	8,231	45	243

The above figures explain more clearly the great activity in Kentucky and large increase for the year in review over the previous ones than columns of writing could give. Kentucky, without a doubt, today is the most promising field of any of the fields east of the Mississippi River, and during 1918 the field will become more prominent or drop backward again, as all depends upon what will be found in the great amount of wildcat work that is doing and being planned at this time.

WELLS BY MONTHS.

The above wells were distributed, by months during the year in each county, as follows:—

Estill County.

Month.	Comp.	Prod.	Gas.	Dry.
January	83	2,473	..	15
February	57	3,081	1	6
March	72	3,285	1	12
April	68	2,797	..	11
May	101	3,975	..	19
June	83	868	..	12
July	57	545	..	14
August	70	738	1	21
September	30	245	1	3
October	70	683	..	10
November	34	195	..	10
December	28	219	..	9
Totals	763	19,104	4	142
For 1916	770	22,211	6	85
Difference	17	3,107	2	57

Powell County.

Month.	Comp.	Prod.	Gas.	Dry.
January	3	300	..	..
February	9	291	..	3
March	8	510	1	2
April	10	145	..	6
May	12	950	..	3
June	24	371	..	12
July	18	634	..	7
August	36	948	..	6
September	41	2,010	..	6
October	42	1,372	..	6
November	49	1,330	..	5
December	35	569	..	5
Totals	287	9,430	1	61
For 1916	32	401	1	10
Difference	255	9,030	..	51

Allen County.

Month.	Comp.	Prod.	Dry.
January	1	..	1
February	19	1,053	8
March	11	275	7
April	5	900	..
May	14	298	6
June	25	213	13
July	8	130	3
August	13	16	9
September	15	151	2
October	14	255	3
November	16	70	10
December	12	365	3
Totals	153	3,726	65
For 1916	131	3,877	28
Difference	22	151	37

There were four gas wells drilled in Allen county in 1916 and none in 1917.

Wayne County.

Month.	Comp.	Prod.	Dry.
January	3	20	1
March	5	18	3
April	5	11	2
May	7	9	4
June	4	..	4
July	5	2	3
August	5	3	4
September	2	5	1
October	7	20	2
November	4	29	1
December	2	..	2
Totals	49	117	27
For 1916	56	103	27
Difference	7	14	..

Wolfe County.

Month.	Comp.	Prod.	Dry.
February	1	5	..
March	1	3	..
April	3	25	2
May	3	30	1
June	1	10	..
July	1	..	1
August	6	40	4
September	8	65	1
October	6	15	4
November	3	55	..
December	5	40	2
Totals	38	288	15
For 1916	13	132	1
Difference	25	156	14

Knox County.

Month.	Comp.	Prod.	Gas.	Dry.
February	1	5	..	..
March	3	28	..	..
April	6	60	..	..
May	3	75	..	1
June	4	35	1	1
July	2	5	..	1
August	5	95	..	1
September	1	..	..	1
October	4	22	..	..
November	3	15	..	1
December	4	35	..	..
Totals	36	375	1	6

Lee County.

Month.	Comp.	Prod.	Gas.	Dry.
February	2	..	..	2
March	7	85	..	..
May	1	5	..	..
June	2	20	..	..
July	5	25	1	1
September	5	20	..	2
October	4	235	..	1
November	18	155	1	4
December	14	229	..	3
Totals	58	774	2	13
For 1916	4	35	..	2
Difference	54	739	2	11

Lawrence County.

Month.	Comp.	Prod.	Gas.	Dry.
January	1	..	..	1
February	2	10	..	..
March	2	55	..	..
April	4	8	..	2
May	3	18	..	..
June	2	4	..	1
July	2	12	..	..
August	2	12	..	..
September	3	12	..	..
October	5	15	..	1
November	5	19	2	..
December	3	18	..	..
Totals	34	183	2	5
For 1916	21	94	..	1
Difference	13	89	2	4

Lincoln County.

Month.	Comp.	Prod.	Gas.	Dry.
January	1	..	1	..
February	2	..	2	..
March	2	..	1	1
April	1	..	1	..
June	2	..	1	1
August	12	51	2	1
September	3	10	..	1
October	3	30	..	..
December	4	10	..	2
Totals	30	101	8	6

Bath County.

Month.	Comp.	Prod.	Gas.	Dry.
February	2	31	..	1
March	1	..	..	1
May	1	50	..	..
June	2	15	..	1
July	5	110	1	2
August	6	30	2	1
September	4	25	..	1
November	1	..	..	1
December	3	15	..	..
Totals	25	276	3	7
For 1916	3	30	1	1
Difference	22	246	2	6

Jackson County.

Month.	Comp.	Prod.	Dry.
January	1	..	1
April	1	10	..
May	1	25	..
June	4	25	2
July	4	..	4
October	2	20	1
November	4	40	1
December	2	25	..
Totals	19	145	10
For 1916	3	..	3
Difference	16	145	7

Rockcastle County.

Month.	Comp.	Prod.	Dry.
April	1	10	..
May	1	5	..
June	2	5	1
July	3	5	2
September	8	9	..
Totals	15	34	3
For 1916	8	..	7
Difference	7	34	4

One gas well was drilled in Rockcastle county in 1916.

Warren County.

Month.	Comp.	Prod.	Gas.	Dry.
February	1	..	..	1
May	2	20	..	1
July	1	50	..	..
August	1	..	..	1
September	3	5	1	1
November	5	50	..	1
December	1	..	..	1
Totals	14	125	1	6
For 1916	2	1	..	1
Difference	12	124	1	5

Whitley County.

Month.	Comp.	Prod.	Gas.	Dry.
January	4	110	..	2
February	2	60	..	1
April	1	..	1	..
May	1	..	..	1
August	2	..	2	..
October	2	5	..	1
December	1	..	1	..
Totals	13	175	4	5
For 1916	2	10	..	1
Difference	11	165	4	4

Morgan County.

Month.	Comp.	Prod.	Gas.	Dry.
February	1	5	..	..
March	1	..	..	1
April	1	..	1	..
May	1	2	..	..
June	1	25	..	..
August	3	4	1	1
September	2	10	..	1
December	2	..	1	1
Totals	12	46	3	4
For 1916	7	30	..	5
Difference	5	16	3	1

McCreary County.

Month.	Comp.	Prod.	Dry.
February	2	20	1
April	1	12	..
May	5	90	..
June	1	15	..
December	1	..	1
Totals	10	137	2

Barren County.

Month.	Comp.	Prod.	Gas.	Dry.
January	1	15	..	..
February	1	25	..	..
May	1	..	..	1
June	1	..	..	1
July	1	6	..	..
September	3	3	2	..
October	2	10	1	..
Totals	10	59	3	2
For 1916	7	22	..	2
Difference	3	37	3	..

Taylor County.

Month.	Comp.	Prod.	Gas.	Dry.
September	1	..	1	..
October	4	..	4	..
November	4	..	4	..
December	1	..	..	1
Totals	10	..	9	1

Metcalf County.

Month.	Comp.	Prod.	Dry.
February	1	10	..
June	2	..	2
July	3	5	2
August	1	5	..
November	1	..	1
December	1	5	..
Totals	9	25	5
For 1916	4	12	2
Difference	5	13	3

Green County.

Month.	Comp.	Gas.	Dry.
June	1	..	1
July	1	..	1
September	1	1	..
December	4	4	..
Totals	7	5	2

Grayson County.

Month.	Comp.	Prod.	Gas.	Dry.
January	1	..	..	1
August	2	10	..	..
September	2	..	1	1
December	1	..	..	1
Totals	6	10	1	3

One gas well was drilled in Grayson county in 1916.

Pulaski County.

Month.	Comp.	Prod.	Gas.	Dry.
October	1	10	..	..
November	2	..	1	1
December	3	..	1	2
Totals	6	10	2	3

LaRue County.

Month.	Comp.	Gas.	Dry.
September	1	..	1
October	4	3	1
December	1	..	1
Totals	6	3	3

Magoffin County.

Month.	Comp.	Prod.
May	3	20
July	1	3
September	1	3
Totals	5	26

Adair County.

Month.	Comp.	Prod.	Dry.
June	1	..	1
July	1	5	..
November	2	3	1
Totals	4	8	2

Simpson County.

Month.	Comp.	Prod.	Dry.
June	1	..	1
October	1	10	..
December	1	5	..
Totals	3	15	1

One gas well was drilled in Simpson county in 1916.

Floyd County.

Month.	Comp.	Prod.	Gas.
April	1	..	1
July	1	5	..
December	1	1	..
Totals	3	6	1

Boyle County.

Month.	Comp.	Prod.	Dry.
July	1	4	..
October	1	..	1
December	1	..	1
Totals	3	4	2

Johnson County.

Month.	Comp.	Gas.	Dry.
February	1	..	1
November	1	1	..
December	1	..	1
Totals	3	1	2

Rowan County.

Month.	Comp.	Dry.
December	3	3

Greenup County.

Month.	Comp.	Gas.	Dry.
February	1	1	..
September	1	..	1
December	1	..	1
Totals	3	1	2

Madison County.

Month.	Comp.	Dry.
November	1	1
December	1	1
Totals	2	2

Clay County.

Month.	Comp.	Gas.
August	1	1
October	1	1
Totals	2	2

Owsley County.

Month.	Comp.	Dry.
July	1	1
December	1	1
Totals	2	2

Casey County.

Month.	Comp.	Dry.
August	1	1
October	1	1
Totals	2	2

Monroe County.

Month.	Comp.	Prod.	Dry.
November	1	..	1
December	1	5	..
Totals	2	5	1

The balance of the counties shows one well each and shows in the recapitulation.

RECAPITULATION.

The total wells finished in the various Kentucky counties in 1917 were as follows:—

County.	Comp.	Prod.	Gas.	Dry.
Estill	753	19,104	4	142
Powell	287	9,430	1	61
Allen	153	3,726	..	65
Wayne	49	117	..	27
Wolfe	38	288	..	15
Knox	36	375	1	6
Lee	58	774	2	13
Lawrence	34	183	2	5
Lincoln	30	101	8	6
Bath	25	276	3	7
Jackson	19	145	1	10
Rockcastle	15	34	..	3
Warren	14	125	1	6
Whitley	13	175	4	5
Morgan	12	46	3	4
McCreary	10	137	..	2
Barren	10	59	3	2
Taylor	10	..	9	1
Metcalf	9	25	..	5
Green	7	..	5	2
Grayson	6	10	1	3
Pulaski	6	10	2	3
LaRue	6	..	3	3
Magoffin	5	26	..	..
Adair	4	8	..	2
Simpson	3	15	..	1
Floyd	3	6	1	..
Boyle	3	4	..	2
Johnson	3	..	1	2
Rowan	3	..	..	3
Greenup	3	..	1	2
Madison	2	..	..	2
Clay	2	..	2	..
Owsley	2	..	..	2
Casey	2	..	..	2
Monroe	2	5	..	1
Hardin	1	..	1	..
Woodford	1	..	1	..
Menifee	1	..	1	..
Clark	1	..	..	1
Carter	1	..	1	..
Perry	1	..	..	1
Breathitt	1	..	..	1
Hopkins	1	..	..	1
Webster	1	..	..	1
Montgomery	1	..	..	1
Marion	1	..	..	1
Totals	1,648	35,204	61	422

KENTUCKY GUSHERS.

The following gushers were drilled in the various Kentucky fields each month as follows:—

January.

ESTILL COUNTY.

J. T. Hervey & Co., No. 9 Henderson tract, 100 barrels.

Carter Oil Company, No. 1 Wagers tract, 100 barrels.

Root-Hupp Company, No. 11 Hamilton tract, 100 barrels.

Meldren & Keating Nos. 7, 8, 9, 10 and 11 Wilson tract, 150, 100, 150, 150, and 150 barrels, respectively.

February.

ESTILL COUNTY.

Gaines, Marcum & Neeley, No. 3 Arvin tract, 100 barrels, and No. 6 Edwards tract, 100 barrels.

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Alum, Ammonia & Potash
Aluminum Sulphate (Techn & Iron Free)
ANILINE OIL 99½%, WHITE
ANILINE COLORS (COTTON, WOOL & SILK)
Barium Chloride & Carbonate
Barium Peroxide
BENZOL & DERIVATES
Bleaching Powder (Chloride of Lime)
Blue Vitriol (Copper Sulphate)
Carbon Tetrachloride
Cyanide of Potassium & Sodium 128%
DYE WOOD EXTRACTS
Campeche, Fustic, Gambier, Mangrove,
Nutgall, Quebracho & Sumach)
Formaldehyde
Glycerine
HEMATINE (Paste & Crystals)
Magnesium Chloride (Fused & Crystals)
MAGNESITE (Crude & Calcined)
Manganese
Metals (Rare)
NAPHTALENE & DERIVATES
Naphtol, Beta & Alpha
Naphtol, Benzo (Betanaphtol-Benzoate)
NITRANILINE, PARA
Oils (Vegetable-Coconut, Palm, Olive, etc.)
Peroxides (Barium, Hydrogen, etc.)
POTASH BICHROMATE
Potash, Caustic & Carbonate
Potash, Chlorate & Muriate
Potash Permanganate
Potash Prussiate
Soda Ash 58% (Carbonate)
SODA BICHROMATE
Soda Caustic 76 deg.
Soda Chlorate
Soda Sulphide
Soda Ferrocyanide
Thorium Oxide
Tin Oxide
Tungstic Acid (Wolfram)
Uranium Oxide
Vanadium Oxides
Vaseline
Waxes (Paraffine, etc.)

Headquarters for Textile, Leather, Paper, Rubber and Ink Trades

J. T. Hervey & Co., No. 10 Henderson tract, 100 barrels.

Dye & Young, No. 3 Miller tract, 100 barrels. W. L. Parmenter & Co., No. 4 Powell tract, 300 barrels, and No. 5 was 500 barrels.

Meldren & Keating, Nos. 12, 13, 14, 15 and 16 Wilson tract, 150 barrels each.

POWELL COUNTY.

Wm. H. Hearne & Co., No. 3 White tract, 250 barrels.

ALLEN COUNTY.

Snowden Bros., No. 4 Richards tract, 250 barrels; No. 2 Jones tract, 150 barrels, and No. 3 Jones tract, 270 barrels.

Petroleum Oil and Gas Company, No. 2 Tucker tract, 300 barrels.

March.

ESTILL COUNTY.

Meldren & Keating, Nos. 18, 19, 21 and 22, at 200 barrels each, and No. 20, at 150 barrels. W. L. Parmenter & Co., Nos. 6, 7 and 8 Powell tract, 150 barrels each, and Nos. 9 and 10, at 125 barrels each.

J. T. Hervey & Co., No. 11 Henderson tract, 100 barrels.

POWELL COUNTY.

Pat J. White, Nos. 6 and 7 Ashley tract, 200 barrels each.

Carl K. Dresser, No. 2 Rogers tract, 100 barrels.

ALLEN COUNTY.

Republic Oil Company, No. 1 Fisher tract, 200 barrels.

April.

ESTILL COUNTY.

Meldren & Keating, Nos. 23, 24, 25 and 26 Wilson tract, at 150 barrels each, and Nos. 27 and 28, at 200 barrels each.

Cambrian Oil Company, No. 2 Bishon tract, and No. 2 Adams tract, 100 barrels each.

White, Newton & Moore, No. 7 Bratlin tract, 125 barrels.

Gaines, Marcum & Neely, No. 3 Rose tract, 100 barrels.

Dulin, Hupp & Co., No. 1 Rogers tract, 100 barrels.

POWELL COUNTY.

Root-Hupp Company, No. 1 Powell tract, 100 barrels.

ALLEN COUNTY.

White Plains Oil Company, No. 1 McReynolds tract, 100 barrels.

Kipawva Oil Company, Nos. 1 and 2 Jenkins tract, 100 barrels each.

Republic Oil Company, Nos. 2 and 3 Fisher tract, 200 barrels each.

May.

ESTILL COUNTY.

Gaines, Marcum & Neely, No. 6 Ross tract, 100 barrels.

Wood Oil Company, No. 1 T. McCoy tract, 350 barrels.

Meldren & Keating, No. 7 Watson tract, 350 barrels, and No. 9 same tract, 150 barrels.

D. D. Giannagan, Nos. 1 and 3 Tipton tract, 150 barrels each; No. 2 same tract, 200 barrels, and Nos. 4 and 6 same tract, 100 barrels each.

POWELL COUNTY.

Pat J. White, Nos. 9 and 10 Ashley tract, 250 barrels each.

Carl K. Dresser, No. 3 Rogers tract, 225 barrels.

Wm. H. Hearne & Co., No. 6 White tract, 200 barrels.

ALLEN COUNTY.

Republic Oil Company, No. 4 Fisher tract, 100 barrels.

BATH COUNTY.

B. F. Roberts & Co., No. 1 R. Grough tract, 120 barrels.

June.

POWELL COUNTY.

Pat. J. White, No. 11 Ashley tract, 200 barrels.

Carl K. Dresser, No. 1 Rogers tract, 150 barrels.

Pilot Knob Oil Company, No. 1 H. Sparks tract, 200 barrels.

JACKSON COUNTY.

Bahan, Barker & Fister, No. 1 Lenhart tract, 100 barrels.

July.

POWELL COUNTY.

Carl K. Dresser, No. 5 Rogers tract, 100 barrels.

Pat. J. White, Nos. 13 and 14 Ashley tract, 200 barrels each.

Bundy & Hare, No. 3 Harris heirs' tract, 110 barrels.

BATH COUNTY.

Thompson & Fox, No. 1 McCarty tract, 118 barrels.

August.

POWELL COUNTY.

Carl K. Dresser, No. 6 Rogers tract, 150 barrels.

Pat. J. White, No. 16 Ashley tract, 100 barrels.

Foreman & Hockstetter, No. 3 Sparks tract, 150 barrels.

Cumberland Petroleum Exploration Company, No. 2 Pruitt-Miller tract, 200 barrels, and No. 4 same tract, 150 barrels.

September.

POWELL COUNTY.

Pat. J. White, Nos. 19, 20, 22, 23, 24, 25 and 26 Ashley tract, 100, 300, 300, 250, 125, 150 and 200 barrels, respectively.

Carl K. Dresser, Nos. 7 and 9 Rogers tract, 150 and 250 barrels.

Cherokee Oil Company, No. 9 Baker tract, 150 barrels.

October.

POWELL COUNTY.

Pat. J. White, No. 32 Ashley tract, 150 barrels.

Cherokee Oil Company, No. 10 Baker tract, 125 barrels.

Carl K. Dresser, No. 11 Rogers tract, 200 barrels.

Weideman & Slagle, No. 3 Hilton tract, 100 barrels.

Pilot Knob Oil Company, No. 7 Baker tract, 100 barrels.

Cumberland Petroleum Exploration Company, Nos. 4, 5, 6 and 7 Pruitt-Miller tract, 125, 250, 100 and 100 barrels, respectively.

LEE COUNTY.

Caddy Oil Company, No. 4 Wells tract, 200 barrels.

ALLEN COUNTY.

Christian & Co., No. 1 Moore tract, 500 barrels.

November.

POWELL COUNTY.

P. J. White, Nos. 30 and 35 Ashley tract, 250 barrels each.

Cherokee Oil Company, No. 11 Baker tract, 150 barrels.

Pilot Knob Oil Company, No. 8 Baker tract, 200 barrels.

Carl K. Dresser, Nos. 12 and 14 Rogers tract, 100 and 200 barrels.

Kentucky Petroleum Producing Company, No. 16 Adams tract, 100 barrels.

Cumberland Petroleum Exploration Company, Nos. 8, 9, 10, 11 and 12 Pruitt-Miller tract, 150, 100, 250, 100 and 125 barrels, respectively.

LEE COUNTY.

Caddy Oil Company, No. 5 Wells tract, 100 barrels.

December.

ESTILL COUNTY.

Pat. J. White, No. 41 Ashley tract, 150 barrels.

Cherokee Oil Company, No. 15 Baker tract, 100 barrels.

Pilot Knob Oil Company, No. 12 Baker tract, 100 barrels.

LEE COUNTY.

Southwest Petroleum Company, No. 4 Eureka tract, 270 barrels.

ALLEN COUNTY.

J. W. Cashdollar, Kirby and Wagner tracts, 198 and 100 barrels of oil.

Hamilton Oil Company, Johnson tract, 500 barrels, and Wheat tract, 100 barrels.

TENNESSEE.

More New Production Wells in One County.

The Tennessee field has not as yet come into its own, but time is now short for there is destined to be a lot of oil found within the State's border. This State has been looked upon for years in disdain by the old line operators, and they have a reason for feeling the way they do, for much money was dropped in the early stages of the Tennessee development of some years ago. During the past year the finished wells were centered in Scott county, but wells are now under way in several counties in the State, and some deep test work will be done in Macon county by the State Line Oil and Gas Company of Kansas, as soon as the roads are in condition to move material.

The wells for 1917 in the Tennessee field were finished by months as follows:—

The Year's Work.

Month.	Comp.	Prod.	Gas.	Dry.
February	1	250	..	..
March	1	200	..	..
April	1	..	1	1
June	3	70	..	..
July	1	..	..	1
September	3	95	..	..
October	1	..	1	..
Totals	11	615	2	1
For 1916	20	45	..	18
Difference	9	570	2	17

EASTERN PIPELINE RUNS LESS THAN FOR 1916—DELIVERIES 629,000 BBLS. LARGER

The statistical end of the petroleum industry, in the way of the amount of crude oil run from the wells and the deliveries, present many interesting comparisons. In the high grade fields east of the Mississippi River during the year 1917 there were 35,446,967.16 barrels run from the wells, and the deliveries of oil for the same period amounted to 48,733,214.89 barrels, over 12,000,000 more barrels than were produced.

The runs listed as Pennsylvania oils include Pennsylvania, Southern New York and West Virginia.

Runs and Deliveries.

The runs and deliveries of oil during 1917 from the fields east of the Mississippi River were as follows:—

Field.	Runs, barrels.	Deliveries, barrels.
Pennsylvania	15,173,770.79	29,392,848.08
Franklin, Pa., heavy	32,407.32	53,976.36
Southeastern Ohio	3,516,239.78	38,772.71
Cleveland, Ohio	28,364.24	30,072.63
Northwestern Ohio	1,935,912.78	6,477,590.79
Indiana	224,524.00	10,467,202.48
Illinois	11,520,108.39	2,187,886.90
Kentucky	3,015,639.86	84,864.94
Totals	35,446,967.16	48,733,214.89
1916	35,550,805.64	48,104,291.00

Stocks Held.

The stocks of oil held by the pipelines at the close of 1917 in the above fields were as follows:—

Field.	Stocks, barrels.
Pennsylvania grades	5,328,028.05
Franklin, Pa., heavy	12,234.36
Southeastern Ohio	321,438.26
Cleveland, Ohio	1,389.15
Northwestern Ohio	2,042,633.00
Indiana	988,431.50
Kentucky	147,664.78
Illinois	2,195,739.98
Total	11,037,559.08
For 1916	11,061,679.07
Difference	24,119.99

High Grade Fields.

The runs and deliveries of the various pipelines handling oils in all fields east of the Mississippi River, known as the high grade fields, for each month during 1917 were as follows:—

Month.	Runs, barrels.	Deliveries, barrels.
January	2,954,746.77	4,048,436.16
February	2,545,809.05	3,724,754.73
March	3,096,238.74	3,902,288.55
April	2,856,633.51	3,663,958.03
May	3,310,777.18	3,583,512.63
June	3,011,696.77	3,903,701.74
July	3,116,305.19	4,393,378.77
August	3,101,124.85	4,089,696.57
September	2,849,996.38	4,053,445.91
October	3,106,045.30	4,638,459.31
November	2,875,927.26	4,473,257.62
December	2,622,666.16	4,258,324.87
Totals	35,446,967.16	48,733,214.89

Pennsylvania Grades.

The runs and deliveries of oil from the Pennsylvania, Southern New York and West Virginia field, known as Pennsylvania grade oils, for each month of 1917 were as follows:—

Month.	Runs, barrels.	Deliveries, barrels.
January	1,259,374.98	2,235,867.67
February	1,105,784.35	2,103,725.73
March	1,362,464.37	2,362,012.50
April	1,265,944.63	2,168,677.90
May	1,505,246.86	1,969,939.66
June	1,284,270.02	2,362,095.27
July	1,304,390.62	2,739,505.07
August	1,286,140.32	2,657,684.62
September	1,154,444.67	2,299,586.57
October	1,308,003.61	2,623,222.57
November	1,181,112.59	2,681,022.53
December	1,155,593.77	2,789,507.99
Totals	15,173,770.79	29,392,848.08
For 1916	15,494,125.98	27,306,000.30

Stocks on Hand.

The following were the stocks on hand or in storage of Pennsylvania grades of oil for each month of 1917:—

Month.	Stocks, barrels.
January	5,871,430.39
February	5,777,254.13
March	5,742,758.99
April	4,261,108.23
May	5,682,335.48
June	5,967,746.06
July	6,344,635.67
August	6,507,503.90
September	6,302,298.16
October	6,012,440.62
November	5,599,805.30
December	5,328,028.05

Franklin Heavy Oils.

The runs and deliveries of Franklin, Pa., heavy oils each month for 1917 were as follows:—

Month.	Runs, barrels.	Deliveries, barrels.
January	2,932.52	5,537.18
February	2,030.78	486.17
March	2,864.42	29.93
April	3,236.28	71.90
May	2,777.55	.....
June	2,995.54	6,666.62
July	2,710.56	.....
August	2,712.02	14,094.25
September	2,691.08	9,487.65
October	2,839.44	10,445.06
November	2,428.75	6,902.03
December	2,188.38	655.57
Totals	32,407.32	53,976.36
For 1916	36,227.74	43,605.12

Franklin Stocks.

The stocks in storage of Franklin, Pa., heavy oils at the close of each month during 1917 were as follows:—

Month.	Stocks, barrels.
January	31,110.31
February	32,054.93
March	35,489.41
April	39,689.72
May	41,461.27
June	37,790.19
July	39,879.00
August	29,123.52
September	22,326.95
October	14,775.33
November	10,602.05
December	12,234.36

Southeastern Ohio Field.

The runs and deliveries from the Southeastern Ohio fields each month for the year 1917 were as follows:—

Month.	Runs, barrels.	Deliveries, barrels.
January	281,351.36	5,723.02
February	252,464.24	3,362.91
March	296,616.81	3,874.76
April	288,876.92	4,329.97
May	312,683.92	4,507.52
June	300,032.95	1,935.31
July	312,787.62	703.27
August	318,942.50	1,866.66
September	289,427.91	773.39
October	315,738.04	2,814.06
November	290,214.27	4,639.99
December	255,103.24	4,331.25
Totals	3,516,239.78	38,772.71
For 1916	3,346,636.67	26,056.30

Oil Stocks.

The stocks of oil on hand at the close of each month of 1917 in the Southeastern Ohio field were as follows:—

Month.	Stocks, barrels.
January	600,161.33
February	487,828.98
March	520,162.73
April	551,087.63
May	514,475.77
June	466,551.89
July	466,263.19
August	517,622.61
September	540,546.68
October	359,006.01
November	313,525.22
December	321,438.26

Cleveland Field.

The runs and deliveries of oil from the Cleveland, Ohio, field each month for the year 1917 were as follows:—

Month.	Runs, barrels.	Deliveries, barrels.
January	1,816.98	1,951.76
February	1,513.79	2,459.89
March	3,036.12	3,558.39
April	2,418.91	2,363.11
May	3,023.59	2,931.92
June	2,551.14	2,450.64
July	1,989.42	1,786.93
August	2,941.69	3,203.15
September	2,088.46	1,954.24
October	2,553.36	2,681.57
November	2,160.09	2,071.05
December	2,270.69	2,670.98
Totals	28,364.24	30,072.63
For 1916	21,208.38	20,578.01

Storage Oil.

The oil stored at the close of each month of 1917 in the Cleveland, Ohio, field was as follows:—

Month.	Stocks, barrels.
January	1,701.49
February	1,513.79
March	1,069.37
April	1,172.43
May	1,343.13
June	1,473.21
July	1,734.19
August	1,508.37
September	1,682.04
October	1,593.83
November	1,735.16
December	1,389.15

Northwestern Ohio Field.

The runs and deliveries of crude oil from the fields of Northwestern Ohio for 1917 were by months as follows:—

Month.	Runs, barrels.	Deliveries, barrels.
January	169,642.09	391,181.83
February	138,894.69	374,351.22
March	185,900.65	345,845.21
April	164,302.86	532,303.93
May	161,346.58	581,934.71
June	172,360.87	431,004.08
July	167,427.78	677,994.28
August	170,025.91	533,826.25
September	146,793.35	699,979.20
October	164,157.10	477,749.63
November	152,932.22	673,450.59
December	122,128.78	557,967.86
Totals	1,935,912.78	6,477,590.79
For 1916	2,074,879.66	5,535,360.88

Stocks in Storage.

The stocks of crude at the close of each month in the Northwestern Ohio field for 1917 were as follows:—

Month.	Stocks, barrels.
January	2,202,582.91
February	2,269,385.04
March	2,430,787.28
April	2,424,759.44
May	2,654,411.14
June	2,565,866.28
July	2,611,418.70
August	2,515,705.91
September	2,527,878.00
October	2,443,549.77
November	2,305,403.60
December	2,042,633.00

Indiana Fields.

The runs and deliveries of oil from the Indiana field each month for 1917 were as follows:—

Month.	Runs, barrels.	Deliveries, barrels.
January	21,603.36	1,128,072.40
February	17,991.94	936,781.47
March	18,515.77	1,056,013.79
April	20,676.49	797,997.87
May	21,258.52	895,190.59
June	20,250.21	784,565.51
July	20,402.89	762,229.47
August	19,583.40	826,089.30
September	17,180.58	904,684.84
October	18,506.85	893,197.95
November	15,326.42	863,529.20
December	13,462.56	658,870.09
Totals	224,524.00	10,467,202.48

Storage Oil.

The storage oil in the Indiana field at the close of each month of 1917 was as follows:—

Month.	Stocks, barrels.
January	830,264.00
February	822,932.09
March	810,047.43
April	1,031,398.66
May	818,199.80
June	925,622.62
July	921,588.00
August	904,044.49
September	769,904.56
October	894,670.91
November	907,695.03
December	988,431.50

Illinois Field.

The runs and deliveries of oil monthly in the Illinois field for 1917 were as follows:—

Month.	Runs, barrels.	Deliveries, barrels.
January	1,067,630.31	274,486.12
February	891,291.11	273,583.95
March	1,055,515.85	124,556.90
April	948,361.66	119,445.33
May	1,045,874.61	154,555.13
June	975,127.85	111,003.36
July	997,655.71	129,970.85
August	989,477.05	49,315.04
September	913,473.15	147,876.69
October	945,865.43	324,767.08
November	898,855.14	237,767.08
December	790,980.52	240,559.87
Totals	11,520,108.39	2,187,886.90

Oil in Storage.

Oil in storage at the close of each month of the year 1917 in the Illinois field was as follows:—

Month.	Stocks, barrels.
January	2,726,227.95
February	2,847,364.18
March	No reports
April	2,487,243.56
May	2,697,490.62
June	2,486,708.04
July	2,225,074.84
August	2,401,051.56
September	2,389,068.48
October	2,435,741.65
November	2,345,945.71
December	2,195,739.98

Kentucky Field.

The runs and deliveries of oil for 1917 from the Kentucky fields were by months as follows:—

Month.	Runs, barrels.	Deliveries, barrels.
January	150,330.17	5,616.18
February	136,138.25	3,008.39
March	171,324.75	6,397.07
April	162,815.76	38,869.29
May	236,566.54	4,453.10
June	254,108.19	3,978.95
July	303,940.59	3,209.40
August	311,301.96	3,617.30
September	323,897.18	4,103.06
October	346,381.47	3,590.79
November	332,897.78	4,175.15
December	280,933.22	3,861.26
Totals	3,015,639.86	84,864.94

Oil in Storage.

The oil held in stock at the close of each month for 1917 in the Kentucky fields was as follows:—

Month.	Stocks, barrels.
January	207,005.73
February	195,411.32
March	222,802.06
April	207,690.07
May	250,569.05
June	253,522.22
July	230,796.76
August	212,655.14
September	202,466.34
October	180,506.59
November	190,243.86
December	147,664.78

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KANSAS EXCEEDS OKLAHOMA IN NEW PRODUCTION IN THE MID-CONTINENT

Total Production of Field in 1917 was 135,632,794 Barrels, of Which Kansas Had 24,986,761 Barrels Increase Over Year Before.

During the year of 1917 in the Mid-Continent fiield, comprising Oklahoma and Kansas, the total amount of oil produced during that period amounted to 135 632,794 barrels. When compared with the figures for the preceding year of 119 480,490 barrels, it shows that 1917 led by 16,152,304 barrels which was due entirely to the Kansas field, where some gusher wells were developed in Butler County; in fact, the largest wells ever finished in the Mid-Continent field were found during the past year.

Kansas takes first place, therefore, not in the amount of oil produced, but in showing a gain. During 1917 the amount of oil produced was 38,029,561 barrels, and when compared with the figures of 1916, which were 13,042,800 barrels, is shows an increase for the year just passed of 24,986,731 barrels.

Oklahoma, while leading in the amount of oil produced did not hold its own, and during 1917 the production amounted to 97,603,233 barrels. In comparing with the 1916 figures of 106 337,690 barrels it shows a decrease of 8,734 457 barrels for the year.

Kansas Production.

In Kansas the El Dorado-Towanda district led with 19,673,844 barrels, followed by the Augusta pool with 11,458,628 barrels. Both are in Butler county, Kan. In the outside districts the total production amounted to 6,807,089 barrels, showing that the older pools are also more active. On the first of the year the El Dorado pool was producing but 15,613 barrels daily, and at the close it was making 84,088 barrels, showing the large increase that had taken place in the 12 months' time.

At Augusta, in January, the pool was producing 42,004 barrels daily, and in December it was making but 18,450 barrels daily. The first of the year in the outside districts the production was 13,000 barrels daily, and at the close they were producing 24,600 barrels each day. October proved to be the largest month of the year, with 4,546,801 barrels, and the smallest month of the year was February, when only 1,807,596 barrels were produced.

Creek District at Head.

In Oklahoma the Creek district, taking in the territory from Tulsa south to McIntosh county, was the most prolific; this also takes in the Cushing-Shamrock and Yale developments. The total production for the year was 46,443,216 barrels. Next came the Healdton pool in southern Carter county, with 22,396,058 barrels. This development is now the leading producing pool of the state. The Osage was third, with 12,863,800 barrels. October was also the leading month in the Oklahoma field, having an output of 8,367,303 barrels. February was the smallest, with 7,335,328 barrels.

Following will be found the production for the past year in Oklahoma and Kansas, showing the output in each district by months:—

Mid-Continent Production for 1917.

State.	Barrels.
Oklahoma	97,603,233
Kansas	38,029,561
Total	135,632,794

Total Mid-Continent Production by Years.

Year.	Barrels.
Prior to pipelines, 1899	442,379
1900	74,714
1901	179,151
1902	331,749
1903	1,071,015
1904	5,603,036
1905	12,454,818
1906	21,649,154
1907	46,161,654
1908	48,274,782
1909	48,007,267
1910	53,429,313
1911	59,332,850
1912	53,607,472
1913	65,746,650
1914	101,092,263
1915	121,998,915
1916	122,671,767
1917	135,632,794
Total	897,806,952

Oklahoma Production.

Year.	Barrels.
Prior to 1900	4,223
1900	6,150
1901	10,000
1902	36,540
1903	140,000
1904	1,366,700
1905	8,561,950
1906	18,618,583
1907	42,800,250
1908	45,801,575
1909	46,975,150
1910	52,300,000
1911	56,425,700
1912	51,425,430
1913	63,575,200
1914	97,242,263
1915	117,883,115
1916	111,141,280
1917	97,603,233
Total	811,947,444

Kansas Production.

Year.	Barrels.
Prior to pipeline	438,154
1900	68,564
1901	169,151
1902	295,209
1903	931,015
1904	4,236,336
1905	3,892,968
1906	3,075,571
1907	3,331,404
1908	2,473,107
1909	1,032,117
1910	1,129,313
1911	2,907,150
1912	2,182,042
1913	2,171,550
1914	3,850,000
1915	4,115,800
1916	11,530,487
1917	38,029,561
Total	85,859,508

Estimated Production of Fields by Districts, January 1, 1918.

District.	Daily Production.
Kansas	127,138
Cherokee deep sand	16,250
Cherokee shallow sand	8,480
Osage	32,500
Cleveland	6,810
Creek	118,017
Kay	7,185
Healdton	57,311
Miscellaneous, Oklahoma	5,455
Total, January 1, 1918	379,149
Total, January 1, 1917	351,200
Total, January 1, 1916	327,168

Estimated Daily Production January 1, 1918, of Mid-Continent Field by Companies.

Company.	Cushing.	Healdton.	Other Okla. field.	Total Okla.	Kansas.	Total Okla.-Kas.
Carter Oil Co.	1,500	3,900	1,300	6,700	10,500	17,200
Carter Oil Co. & Southwestern Pet Co.	.....	315	550	865	2,300	3,165
Magnolia Pet. Co.	5,378	9,860	5,000	20,238	1,850	22,088
Ohio Oil Co.	.....	.....	.....	.....	1,500	1,500
Prairie Oil & Gas Co.	9,090	.....	13,440	22,530	400	22,930
Stand. Oil Co. of Ind.	.....	.....	.....	.....	50	50
Tidal Oil Co.	2,570	.....	3,325	5,895	1,385	7,280
Gypsy Oil Co.	4,970	435	8,440	13,845	27,000	40,845
Cosden & Co.	4,595	.....	4,580	9,175	950	10,125
Empire Gas & Fuel Co	.....	.....	260	260	32,020	32,280
Okla. Prod. & Ref. Co.	.....	.....	6,500	6,500	140	6,640
Monitor Oil & Gas Co.	850	.....	2,200	3,050	1,500	4,550
Ohio Cities Gas Co.	2,900	2,880	875	6,655	.....	6,655
The Texas Co.	4,300	1,910	2,750	8,960	170	9,030
Wolverine Oil Co.	.....	.....	2,000	.....	.....	2,000
Roxana Pet. Co.	690	6,530	1,000	8,220	.....	8,220
C. B. Shaffer	3,115	.....	50	3,165	2,165	5,330
Sinclair Oil & Gas Co.	4,270	3,755	3,370	11,395	2,500	13,895
Sinclair-Gulf	.....	415	4,150	4,565	.....	4,565
Others	6,819	26,311	83,863	119,993	42,698	160,801
Totals	51,047	57,311	143,653	252,011	127,138	379,149

Oklahoma Production for Year by Months.

Month.	Barrels.
January	8,104,268
February	7,335,328
March	8,241,226
April	8,214,240
May	8,673,707
June	8,202,750
July	8,407,882
August	8,305,458
September	8,002,740
October	8,367,303
November	7,935,990
December	7,812,341
Total	97,603,233

Production by Districts.

District.	Barrels.
Cherokee deep sand	6,500,130
Cherokee shallow sand	3,264,979
Osage	12,863,800
Cleveland	2,541,860
Creek	46,443,216
Kay	2,479,885
Healdton	22,396,058
Wheeler	142,267
Allen	137,246
Lawton	48,790
Billings-Garber	785,002
Total	97,603,233

January, 1917.

CHEROKEE DEEP SAND.

District.	Daily average.	Monthly Prod.
Bartlesville	7,000	217,000
Bird Creek	9,000	279,000
Collinsville-Vera	470	14,570
Copan-Wann	2,800	86,800
Hogshooter	400	12,400
Totals	19,670	609,770

CHEROKEE SHALLOW SAND.

Nowata	5,200	161,200
Delaware	1,000	31,000
Chelsea	3,020	93,620
Inola	70	2,170
Totals	9,290	287,990
OSAGE	31,000	961,000
CLEVELAND	7,000	217,000

CREEK NATION.

Bald Hill	7,000	217,000
Bixby-Leonard	7,900	244,900
Boynton-Cole	4,500	139,500
Glenn pool	13,000	403,000
Cushing-Shamrock	84,001	2,604,031
Hamilton	275	8,525
Henryetta	800	24,800
Kellyville	620	19,220
Lost City	600	18,600
Morris	2,670	82,770
Muskogee	560	17,360
Mounds	700	21,700
Perryman	850	26,350
Schulter	500	15,500
Stone Bluff	2,800	86,800
Tiger Flats	2,900	89,900
Yale	1,820	56,420
Totals	131,496	4,076,376

KAY COUNTY.

Newkirk	550	17,050
Ponca City	430	13,330
Blackwell	2,898	89,838
Totals	3,878	120,218
Healdton	58,383	1,809,873
Wheeler	340	10,540
Lawton	150	4,650
Allen	221	6,851
Totals, January	261,428	8,104,268

February.

CHEROKEE DEEP SAND.

Districts.	Daily average.	Monthly Prod.
Bartlesville	6,850	191,800
Bird Creek	8,780	245,840
Collinsville	425	11,900
Copan-Wann	2,600	72,800
Hogshooter	370	10,360
Totals	19,025	532,700

CHEROKEE SHALLOW SAND.

Nowata	5,300	148,400
Delaware	1,200	33,600
Chelsea	2,200	61,600
Inola	80	2,240
Totals	8,780	245,840
OSAGE	31,250	875,000
CLEVELAND	7,000	196,000

CREEK NATION.

Bald Hill	6,800	190,400
Bixby-Leonard	9,000	252,000
Boynton-Cole	4,750	133,000
Glenn pool	19,000	532,000
Cushing-Shamrock	78,466	2,197,048
Hamilton	1,200	33,600
Henryetta	850	23,800
Kellyville	450	12,600
Lost City	450	12,600
Morris	3,500	98,000
Muskogee	560	15,680
Mounds	720	20,160
Perryman	865	24,220
Schulter	480	13,440
Stone Bluff	2,890	80,920
Tiger Flats	2,950	82,600
Yale	1,945	54,460
Totals	134,876	3,776,528

KAY COUNTY.

Newkirk	525	14,700
Ponca City	420	11,760
Blackwell	2,010	56,280
Totals	2,955	82,740
Healdton	57,374	1,606,472
Wheeler	340	9,520
Lawton	155	4,340
Allen	221	6,188
Totals, February	261,976	7,335,328

March.

CHEROKEE DEEP SAND.

Districts.	Daily average.	Monthly Prod.
Bartlesville	6,800	210,800
Bird Creek	8,650	268,150
Collinsville-Vera	400	12,400
Copan-Wann	2,500	77,500
Hogshooter	350	10,850
Totals	18,700	579,700

CHEROKEE SHALLOW SAND.

Nowata	5,200	161,200
Delaware	1,800	55,800
Chelsea	2,100	65,100
Inola	100	3,100
Totals	9,200	285,200
OSAGE	32,500	1,007,500
CLEVELAND	7,000	217,000

CREEK NATION.

Bald Hill	6,750	209,250
Bixby-Leonard	9,750	302,250
Boynton-Cole	5,500	170,500
Glenn pool	17,500	542,500
Cushing-Shamrock	76,330	2,366,230
Hamilton	850	26,350
Henryetta	1,100	34,100
Kellyville	450	13,950
Lost City	430	13,330
Morris	3,950	122,450
Muskogee	560	17,360
Mounds	900	27,900
Perryman	860	226,650
Schulter	350	10,850
Stone Bluff	2,500	77,500
Tiger Flats	3,000	93,000
Yale	3,012	93,372
Totals	133,792	4,147,552

KAY COUNTY.

Newkirk	525	16,275
Ponca City	420	13,020
Blackwell	3,900	120,900
Totals	4,845	150,195
Healdton	58,844	1,824,164
Wheeler	340	10,540
Lawton	100	3,100
Allen	125	3,875
Billings-Garber	400	12,400
Totals, March	265,846	8,241,226

April.

CHEROKEE DEEP SAND.

Districts.	Daily average.	Monthly Prod.
Bartlesville	6,900	207,000
Bird Creek	8,800	264,000
Collinsville-Vera	400	12,000
Copan-Wann	2,300	69,000
Hogshooter	350	10,500
Totals	18,750	562,500

CHEROKEE SHALLOW SAND.

Nowata	5,000	150,000
Delaware	1,750	52,500
Chelsea	2,100	63,000
Inola	100	3,000
Totals	8,950	268,000
OSAGE	40,000	1,200,000
CLEVELAND	6,500	195,000

CREEK NATION.

Bald Hill	7,200	216,000
Bixby-Leonard	11,000	330,000
Boynton-Cole	5,600	168,000
Glenn pool	16,000	480,000
Cushing-Shamrock	72,033	2,160,990
Hamilton	830	24,900
Henryetta	1,000	30,000
Kellyville	350	10,500
Lost City	420	12,600
Morris	4,000	120,000
Muskogee	460	13,800
Mounds	1,200	326,000
Perryman	825	24,750
Schulter	325	9,750
Stone Bluff	2,200	66,000
Tiger Flats	2,600	78,000
Yale	2,900	87,000
Totals	128,943	3,868,290

KAY COUNTY.

Newkirk	520	15,600
Ponca City	400	12,000
Blackwell	6,100	183,000
Totals	7,020	210,600
Healdton	62,320	1,869,600
Wheeler	300	9,000
Lawton	100	3,000
Allen	125	3,750
Billings-Garber	800	24,000
Totals, April	273,808	8,214,240

May.

CHEROKEE DEEP SAND.

District.	Daily average.	Monthly Prod.
Bartlesville	6,860	212,660
Bird Creek	8,500	263,500
Collinsville-Vera	400	12,400
Copan-Wann	2,200	68,200
Hogshooter	300	9,300
Totals	18,260	566,060

CHEROKEE SHALLOW SAND.

Nowata	5,000	155,000
Delaware	1,700	52,700
Chelsea	2,200	68,200
Inola	250	7,750
Totals	9,150	283,650
OSAGE	41,000	1,271,000
CLEVELAND	7,000	217,000

CREEK NATION.

Bald Hill	7,500	232,500
Bixby-Leonard	10,000	310,000
Boynton-Cole	5,600	173,600
Glenn pool	18,000	558,000
Cushing-Shamrock	67,821	2,102,451
Hamilton	900	27,900
Henryetta	1,000	31,000
Kellyville	500	15,500
Lost City	420	13,020
Morris	5,000	155,000
Muskogee	460	14,260
Mounds	1,200	37,200
Perryman	900	27,900
Schulter	325	10,075
Stone Bluff	2,400	74,400
Tiger Flats	2,600	80,600
Yale	3,698	114,638
Totals	128,324	3,978,044

KAY COUNTY.

Newkirk	520	16,120
Ponca City	400	12,400
Blackwell	5,775	179,025
Totals	6,695	207,545
Healdton	67,384	2,088,904
Wheeler	355	11,005
Lawton	150	4,650
Allen	379	11,749
Billings-Garber	1,100	34,100
Total Oklahoma, May.	279,797	8,673,707

June.

CHEROKEE DEEP SAND.

District.	Daily average.	Monthly Prod.
Bartlesville	6,800	204,000
Bird Creek	8,420	252,600
Collinsville-Vera	400	12,000
Copan-Wann	2,100	63,000
Hogshooter	290	8,700
Totals	18,010	540,300

CHEROKEE SHALLOW SAND.

Nowata	4,900	147,000
Delaware	1,640	49,200
Chelsea	2,120	63,600
Inola	270	8,100
Totals	8,930	267,900
OSAGE	41,000	1,230,000
CLEVELAND	7,000	210,000

CREEK NATION.

Bald Hill	8,000	240,000
Bixy-Leonard	9,000	270,000
Boynton-Cole	5,500	165,000
Glenn pool	18,000	540,000
Cushing-Shamrock	62,424	1,872,720
Hamilton	900	27,000
Henryetta	1,000	30,000
Kellyville	450	13,500
Lost City	400	12,000
Morris	4,500	135,000
Muskogee	450	13,500
Mounds	1,200	36,000
Perryman	950	28,500
Schulter	325	9,750
Stone Bluff	2,400	72,000
Tiger Flats	2,600	78,000
Yale	6,000	180,000
Totals	124,099	3,722,970

KAY COUNTY.

Newkirk	520	15,600
Ponca City	400	12,000
Blackwell	5,331	159,930
Totals	6,251	187,530

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Healdton	66,180	1,985,400
Wheeler	365	10,950
Lawton	150	4,500
Allen	250	7,500
Billings-Garber	1,200	36,000
Totals, Oklahoma, June	273,425	8,202,750

July.

CHEROKEE DEEP SAND.

District.	Daily average.	Monthly Prod.
Bartlesville	6,820	211,420
Bird Creek	8,450	261,950
Collinsville-Vera	400	12,400
Copan-Wann	2,200	68,200
Hogshooter	300	9,300
Totals	18,170	563,270

CHEROKEE SHALLOW SAND.

Nowata	4,980	154,380
Delaware	1,680	52,080
Chelsea	2,100	65,100
Inola	250	7,750
Totals	9,010	279,310
OSAGE	34,000	1,054,000
CLEVELAND	7,000	217,000

CREEK NATION.

Bald Hill	8,200	254,200
Bixby-Leonard	9,050	280,550
Boynton-Cole	5,700	176,700
Glenn pool	18,200	564,200
Cushing-Shamrock	61,917	1,919,427
Hamilton	900	27,900
Henryetta	1,000	31,000
Kellyville	470	14,570
Lost City and Red Fork	400	12,400
Morris	4,500	139,500
Muskogee	460	14,260
Mounds	1,200	37,200
Perryman, Jenks, Broken Arrow	970	30,070
Schulter	350	10,850
Stone Bluff	2,350	72,850
Tiger Flats	2,700	83,700
Yale	9,500	294,500
Totals	127,867	3,963,877

KAY COUNTY.

Newkirk	500	15,500
Ponca City	450	13,950
Blackwell	6,046	187,426
Totals	6,996	216,876
Allen	330	10,230
Billings-Carter	2,443	75,733
Healdton	64,906	2,012,086
Lawton	150	4,650
Wheeler	350	10,850
Totals, Oklahoma	271,222	8,407,882

August.

District.	Daily average.	Monthly Prod.
CHEROKEE DEEP SAND.		
Bartlesville	6,800	210,800
Bird Creek	8,400	260,400
Collinsville-Vera	380	11,780
Copan-Wann	2,000	62,000
Hogshooter	275	8,525
Totals	17,855	553,505
CHEROKEE SHALLOW SAND.		
Nowata	4,920	152,520
Delaware	1,675	51,925
Chelsea	2,100	65,100
Inola	250	7,750
Totals	8,945	277,295
OSAGE	34,800	1,078,800
CLEVELAND	7,000	217,000
CREEK NATION.		
Bald Hill	8,100	251,100
Bixby-Leonard	11,000	341,000
Boynton-Cole	6,500	201,500
Glenn pool	18,000	558,000
Cushing-Shamrock	56,904	1,764,024
Hamilton	900	27,900
Henryetta	600	18,600
Kellyville	500	15,500
Lost City and Red Fork	800	24,800
Morris	3,400	105,460
Muskogee	450	13,950
Mounds	1,100	341,000
Perryman, Jenks, Broken Arrow	2,900	89,900
Schulter	300	9,300
Stone Bluff	1,600	49,600
Tiger Flats	2,300	71,300
Yale	11,427	354,237
Totals	126,781	3,930,211
KAY COUNTY.		
Newkirk	500	15,500
Ponca City	400	12,400
Blackwell	6,000	186,000
Totals	6,900	213,900
Allen	433	13,423
Billings	1,076	33,356
Garber	1,685	51,615
Healdton	61,958	1,920,698
Lawton	150	4,650
Wheeler	355	11,005
Totals, Oklahoma	267,918	8,305,458

September.

CHEROKEE DEEP SAND.

District.	Daily average.	Monthly prod.
Bartlesville	6,290	188,700
Bird Creek	7,000	210,000
Collinsville-Vera	400	12,000
Copan-Wann	1,500	45,000
Hogshooter	285	8,550
Totals	15,475	464,250
CHEROKEE SHALLOW SAND.		
Nowata	4,890	146,700
Delaware	1,635	49,050
Chelsea	2,120	63,600
Inola	275	8,250
Totals	8,920	267,600
OSAGE	33,800	1,014,000
CLEVELAND	7,000	210,000
CREEK NATION.		
Bald Hill	8,000	240,000
Bixby-Leonard	8,300	249,000
Boynton-Cole	5,600	168,000
Glenn pool	19,000	570,000
Cushing-Shamrock	58,189	1,745,670
Hamilton	980	29,400
Henryetta	800	24,000
Kellyville	400	12,000
Lost City and Red Fork	500	15,000
Morris	3,500	105,000
Muskogee	350	10,500
Mounds	1,090	32,700
Perryman, Jenks, Broken Arrow	2,900	87,000
Schulter	320	9,600
Stone Bluff	2,000	60,000
Tiger Flats	2,000	60,000
Yale	12,880	386,400
Totals	126,809	3,804,270
KAY COUNTY.		
Newkirk	430	12,900
Ponca City	500	15,000
Blackwell	7,093	212,790
Totals	8,023	240,690
Allen	545	16,350
Billings	1,076	32,280
Garber	2,642	79,260
Healdton	61,935	1,858,050
Lawton	125	3,750
Wheeler	408	12,240
Totals	266,758	8,002,740

October.

CHEROKEE DEEP SAND.

District.	Daily average.	Monthly prod.
Bartlesville	6,200	192,200
Bird Creek	8,200	254,200
Collinsville-Vera	325	10,075
Copan-Wann	1,950	60,450
Hogshooter	250	7,750
Totals, Oklahoma	16,925	524,675
CHEROKEE SHALLOW SAND.		
Nowata	4,882	151,342
Delaware	1,625	50,375
Chelsea	2,117	65,627
Inola	270	8,370
Totals	8,894	275,714
OSAGE	35,000	1,085,000
CLEVELAND	7,250	224,750
CREEK NATION.		
Bald Hill	8,600	248,000
Bixby-Leonard	9,000	279,000
Boynton-Cole	5,500	170,500
Glenn pool	18,000	558,000
Cushing-Shamrock	56,226	1,743,006
Hamilton	550	17,050
Henryetta	420	13,020
Kellyville	410	12,710
Lost City and Red Fork	600	18,600
Morris	3,400	105,400
Muskogee	375	11,625
Mounds	1,450	44,950
Perryman, Jenks, Broken Arrow	2,800	86,800
Schulter	320	9,920
Stone Bluff	1,600	49,600
Tiger Flats	2,200	68,200
Yale	13,000	403,000
Totals	123,851	3,839,381
KAY COUNTY.		
Newkirk	674	20,894
Ponca City	450	13,950
Blackwell	10,519	326,089
Totals	11,643	360,933
Allen	575	17,825
Billings	1,300	140,300
Garber	3,500	108,500
Healdton	60,430	1,873,330
Lawton	125	3,875
Wheeler	420	13,020
Totals, Oklahoma	269,913	8,367,303

November.

CHEROKEE DEEP SAND.

District.	Daily average.	Monthly prod.
Bartlesville	6,155	184,650
Bird Creek	8,100	243,000
Collinsville-Vera	300	9,000
Copan-Wann	1,850	55,500
Hogshooter	250	7,500
Totals	16,655	499,650
CHEROKEE SHALLOW SAND.		
Nowata	4,820	144,600
Delaware	1,600	48,000
Chelsea	2,100	63,000
Inola	250	7,500
Totals	8,770	263,100
OSAGE	36,000	1,080,000
CLEVELAND	7,000	210,000
CREEK NATION.		
Bald Hill	7,950	238,500
Bixby-Leonard	9,050	271,500
Boynton-Cole	5,400	162,000
Glenn pool	17,985	539,550
Cushing-Shamrock	54,728	1,641,840
Hamilton	500	15,000
Henryetta	400	12,000
Kellyville	600	18,000
Lost City and Red Fork	3,370	101,100
Morris	325	9,750
Muskogee	1,500	45,000
Mounds	2,800	84,000
Perryman, Jenks, Broken Arrow	300	9,000
Schulter	2,000	60,000
Stone Bluff	2,100	63,000
Tiger Flats	13,165	394,950
Yale	122,573	3,677,190
Totals	655	19,650
KAY COUNTY.	616	18,480
Newkirk	7,590	227,700
Ponca City	8,861	265,830
Blackwell	640	19,200
Totals	1,590	47,700
Allen	2,809	84,270
Billings	59,028	1,770,840
Garber	125	3,750
Healdton	482	14,460
Lawton	264,535	7,935,990
Wheeler		
Totals, Oklahoma		

December.

CHEROKEE DEEP SAND.

District.	Daily average.	Monthly prod.
Bartlesville	6,000	186,000
Bird Creek	7,920	245,520
Collinsville-Vera	280	8,680
Copan-Wann	1,800	55,800
Hogshooter	250	7,750
Totals	16,250	503,750
CHEROKEE SHALLOW SAND.		
Nowata	4,740	146,940
Delaware	1,520	47,120
Chelsea	2,000	62,000
Inola	220	6,820
Totals	8,480	262,880
OSAGE	32,500	1,007,500
CLEVELAND	6,810	211,110
CREEK NATION.		
Bald Hill	7,800	231,800
Bixby-Leonard	8,920	276,520
Boynton-Cole	5,300	164,300
Glenn pool	16,450	509,950
Cushing-Shamrock	51,047	1,582,457
Hamilton	420	13,020
Henryetta	400	12,400
Kellyville	360	11,160
Lost City and Red Fork	520	26,120
Morris	3,200	99,200
Muskogee	300	9,300
Mounds	1,400	43,400
Perryman, Jenks, Broken Arrow	2,600	80,600
Stone Bluff and Coweta	3,000	93,000
Tiger Flats	2,000	62,000
Yale	14,000	434,000
Schulter	300	9,300
Totals	118,017	3,658,527
KAY COUNTY.		
Newkirk	333	10,323
Ponca City	656	20,336
Blackwell	6,199	192,169
Totals	7,188	222,828
Allen	655	20,305
Billings	1,687	52,297
Garber	2,361	73,191
Healdton	57,311	1,776,641
Lawton	125	3,875
Wheeler	627	19,437
Totals, Oklahoma	252,011	7,812,341

KANSAS.

January, 1917.

District.	Daily average.	Monthly prod.
El Dorado	15,613	484,003
Augusta	42,004	1,304,604
Outside	13,000	403,000
Totals	70,697	2,191,607

February.

El Dorado	16,582	464,296
Augusta	34,475	965,300
Outside	13,500	378,000
Totals	64,557	1,807,596

March.

El Dorado	20,035	621,085
Augusta	36,075	1,118,325
Outside	14,000	434,000
Totals	70,110	2,173,410

April.

El Dorado	23,039	691,170
Augusta	36,369	1,091,070
Outside	14,283	428,490
Totals	73,691	2,210,730

May.

El Dorado	27,346	847,726
Augusta	34,399	1,066,369
Outside	15,129	468,999
Totals	76,874	2,383,094

June.

El Dorado	45,903	1,377,090
Augusta	30,883	926,490
Outside	14,900	447,000
Totals	91,686	2,750,580

July.

El Dorado	54,739	1,696,909
Augusta	30,201	936,231
Outside	17,000	527,000
Totals	101,940	3,160,140

August.

El Dorado	70,115	2,173,565
Augusta	30,090	932,790
Outside	23,000	713,000
Totals	123,205	3,819,355

September.

El Dorado	96,702	2,901,060
Augusta	30,223	906,690
Outside	24,000	720,000
Totals	150,925	4,527,750

October.

El Dorado	94,612	2,932,972
Augusta	27,059	838,829
Outside	25,000	775,000
Totals	146,671	4,546,801

November.

El Dorado	98,908	2,967,240
Augusta	26,666	799,980
Outside	26,000	780,000
Totals	150,574	4,517,220

December.

El Dorado	84,088	2,606,728
Augusta	18,450	571,950
Outside	24,600	762,600
Totals	127,138	3,941,278

PRODUCTION BY MONTHS.

Months.	Barrels.
January	2,191,607
February	1,807,596
March	2,173,410
April	2,210,730
May	2,383,094
June	2,750,580
July	3,160,140
August	3,819,355
September	4,527,750
October	4,546,801
November	4,517,220
December	3,941,278
Total	38,029,561

BY DISTRICTS.

Districts.	Barrels.
El Dorado	19,763,844
Augusta	11,458,628
Outside	6,807,089
Total, 1917	38,029,561
Total, 1916	13,042,800
Increase	24,986,761

Mid-Continent Field Production, 1917.

During the past year in the mid-continent field, including Oklahoma, Kansas and Arkansas, there were not so many wells drilled as in the preceding year. The past year showed 10,300 completions, against 11,241 the previous year, a decrease of 941. Of this amount, Oklahoma led as usual with 6,765, followed by Kansas with 3,495, then Arkansas with 40. The number of successful oil wells was 7,842, against 9,274 the previous year. Oklahoma had 5,080, Kansas 2,762, while there was no oil production in Arkansas. The number of failures was 1,896, against 1,491 in 1916. Oklahoma led with 1,288, Kansas came next with 559, and there were 22 in Arkansas. The gassers for 1917 were 589, against 476 for the preceding year. Oklahoma led with 397, and there were 174 in Kansas and 18 in Arkansas. The new production for 1917 was 686,637 barrels, against 674,731 barrels in 1916. Oklahoma led with 361,172 barrels, and Kansas had 325,465 barrels.

Kansas showed an increase of 142,122 barrels of new production, which was due to the good showing in the Towanda pool in Butler county. On the other hand, Oklahoma dropped 146,129 barrels from the report of the year before. Arkansas started as if it would show something in the gas line, but it dropped off badly toward the close of the year.

One of the most important features was the increase in the credit balances from $1.20 a barrel to $2, and Healdton oil increased from 70 cents to $1.20 a barrel. It remains so at the present time.

October Busiest Month.

In the Oklahoma field October was the busiest month of the year, when 881 wells were finished, of which 685 were successful in making paying oil wells. There were 160 dry holes and 60 gas wells and the new production amounted to 47,028 barrels. The smallest month of the year was March, when only 343 wells were finished, of which 47 were dry and 21 were gassers, leaving 285 producing wells.

The falling off in new production in Oklahoma was a natural one, as there were few new pools opened, and they were not large enough to offset the decline in the daily output in the older developments. The shallow sand development, in the Blackwell pool, in northern Kay county, was one of the leading developments of the year, but in the deep sand, of which much was expected, little of consequence happened. The Garber pool, in Garfield county, and the Billings pool, in Noble county, where some good wells were struck during the closing months of the year, were showing up well, and can be expected to show something worth while this year. These two developments were at their best from July on to the close of December. The discovery of a new sand at Garber at 1,500 feet, known as the Hoston pay, was one of the interesting happenings during the last few months of 1917.

Cushing Had Small Extensions.

There were also extensions to the Cushing pool, but they did not produce any great amount of oil. A new and deeper sand at 3,020 feet started off well, but was not showing so hopefully at the close of December, there being four wells completed, one of which started off at better than 1,000 barrels, another at 400 barrels, while the other two were but small pumpers. Some good wells were developed as usual in various portions of Okmulgee county, which generally can be counted on for something good, and in Waggoner county, near Haskell, some wells averaging better than 1,000 barrels were found. The Osage district made a much better showing than it did the previous year and some good wells were developed near Hominy, and with the leasing of considerable more acreage the present year should be even a better one. In the Cherokee sand districts of Washington and Nowata counties there was not a lot to brag of during the twelve months, although some fair wells were found, but no large amount of new territory was added.

Good Year for Healdton.

The Healdton pool, in southern Carter county, passed through a very good year, and while the southeastern extension failed to show as well as was expected, some good wells were found which helped the pool hold first place in the point of production in the State. The producers were making an earnest endeavor to find a deeper pay sand, and they may be rewarded this year. The Fox pool, in Stephens county, showed several wells of a small size and some enormous gassers, and this district is looked upon as one of the most likely in the entire State.

Another pool that did its bit during the year was the Yale pool, in Payne county, which produced some large wells and was extended in several different directions with the most important find coming toward the latter part of the year to the southeast of the pool over a mile, where a good well was struck. The deepest pay in the State also was uncovered during the year at Ingalls, in the same county, where a good showing was struck at 3,805 feet, but which was spoiled by water. The well was good for at least 200 barrels, and it looks as if a pool would be opened in that direction.

In the development around Tulsa there was nothing to brag of during the year, although occasionally a good well was found, which stimulated operations in its immediate vicinity.

Wildcatting proved a fizzle during the year and there was nothing of any special interest struck. Several important showings were reported from time to time, but very few amounted to anything.

Creek District and Yale Pool.

The Creek district, which takes in the long strip of territory from Tulsa south to McIntosh county, also the Yale pool, was the most active during the year, and 3,073 completions were reported, of which 788 were dry holes and 210 were gassers. This shows that 2,075 wells were paying. The new production was 142,952 barrels. Next came the Cherokee deep sand districts of Washington county, with 845 completions, of which 698 were productive of oil, 29 being gas and 118 dusters. The new production was 15,489 barrels. Next came the Cherokee shallow sand, with 679 completions, of which 597 were paying wells. There were 77 failures and five gassers. The new production was 11,975 barrels. The district which showed the least activity during the year was in Kay county district, where 108 wells were finished, of which 73 were productive and 18 were dry and 17 were gassers. The new production was 34,490 barrels, running fourth in the State as to the amount of new production found.

Towanda Township.

Towanda township, in Butler county, was the leading pool in Kansas and also in the mid-continent field. This pool sprang up from a locality that was thought to be barren, and it developed the largest wells ever struck in this division. One well made as high as 26,000 barrels on initial appearance, and many others averaged around the 20,000-barrel mark for the first 24 hours. This pool was the wonder of the year, and further extensions are looked for at this time. Other portions of the county also were showing good, some large wells being developed at El Dorado and Augusta, and this county was the cause of the State showing an increased production of the year of 25,000,000 barrels. Greenwood county was looking up at the close of 1917, having produced three good wells in virgin territory, and was attracting much attention at the time the new year started. Other pools in Kansas were showing increased activity, but were not producing wells of any large size, although good for their respective localities. The new development in Crawford county attracted but few, and the Labette county proposition proved a money-loser for a great many. The Paola pool, in Miami county, produced some good wells from the shallow sands, and the other districts also showed something of interest from time to time.

Arkansas Failed.

Arkansas proved a failure, and those who spent thousands of dollars for leases are not feeling as well as they did a year ago, although the State may yet develop something. At this time last year some large gassers were being struck and much new work was started, but since then there has been very little done in the way of getting large gassers and oil has yet to make its appearance in commercial quantities.

Up to date in the mid-continent field there has been a total of 91,454 wells completed, but of this amount there are now about 51,000 producing wells in the two States. The largest number of completions since drilling was first started was in 1913, when 11,494 wells were finished. The year 1916 was also an active

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one, 11,241 wells being completed. The largest year in Kansas was 1916, when 3,640 wells reached the completed class, while 1913 was the best year in Oklahoma, there being 9,314 completions.

Summary of Mid-Continent Field Operations in 1917.

WELLS DRILLED, BY YEARS.

Oklahoma, Kansas and Arkansas.

Year.	No. of wells drilled.
1903 and previously	1,590
1904	3,557
1905	4,023
1906	3,876
1907	4,720
1908	3,494
1909	3,850
1910	4,856
1911	4,956
1912	6,906
1913	11,494
1914	10,653
1915	5,848
1916	11,241
1917	10,300
Total	91,454

Wells Drilled in Oklahoma and Kansas.

Year.	No. of wells drilled—In Kansas.	In Oklahoma.
1905	1,488	2,535
1906	730	3,146
1907	486	4,234
1908	473	3,021
1909	510	3,340
1910	486	4,370
1911	511	4,445
1912	1,012	5,982
1913	2,180	9,314
1914	2,394	8,259
1915	1,123	4,725
1916	3,640	7,601
1917	3,495	6,765

OKLAHOMA.

Total Number of Wells Drilled, 1917.

1917.	Completions.	Oil.	Dry.	Gas.	Prod.
January	407	326	49	32	22,841
February	404	300	71	32	32,383
March	343	285	47	21	28,178
April	472	356	83	33	22,659
May	539	366	137	46	22,588
June	533	401	106	26	26,378
July	587	477	91	19	30,645
August	498	401	81	16	37,362
September	655	443	153	59	26,015
October	881	685	160	36	47,028
November	744	538	156	50	30,220
December	612	412	164	36	25,875
Totals	6,765	5,080	1,288	397	361,172
Totals, 1916	7,601	6,107	1,134	360	507,301
Totals, 1915	4,725	3,474	864	387	788,696

Number of Wells by Districts for 1917.

1917.	Completions.	Oil.	Dry.	Gas.	Prod.
Cherokee, deep sand	845	698	118	29	13,489
Cherokee, shallow sand	670	597	77	5	11,975
Cleveland	286	213	41	14	18,108
Cushing	343	292	31	20	25,976
Osage	650	526	64	60	57,101
Creek	3,073	2,075	788	210	142,952
Kay	108	73	18	17	34,490
Healdton	507	449	44	14	41,851
Garfield-Noble	76	56	15	5	11,590
Wildcats	216	101	92	23	3,640
Totals, 1917	6,765	5,080	1,288	397	361,172
Totals, 1916	7,601	6,107	1,134	360	507,301
Totals, 1915	4,725	3,474	864	387	788,696

SUCCESSFUL OIL WELLS IN OKLAHOMA, 1917.

Month.	Cherokee. D.S.	Cherokee S.S.	Cleveland.	Cushing.	Osage.	Creek.	Kay.	Healdton.	Garber-Billings.	Wildcats.
January	35	37	21	25	27	152	2	17	..	10
February	44	53	7	46	27	195	1	10	..	7
March	42	35	3	36	32	102	2	30	..	3
April	55	51	15	29	39	118	3	43	..	3
May	50	40	17	28	22	153	3	42	..	11
June	51	44	18	24	53	140	2	61	..	9
July	60	66	31	26	46	191	2	43	10	2
August	63	41	27	24	48	150	7	35	6	..
September	86	45	18	9	65	162	9	32	9	8
October	73	65	21	17	68	330	15	49	16	31
November	60	87	24	15	57	210	12	51	11	11
December	79	33	11	13	43	172	15	36	4	6
Totals	698	597	213	292	526	2,075	73	449	56	101
Totals, 1916	1,087	1,101	225	139	692	2,115	32	663	..	53
Totals, 1915	341	520	145	51	944	1,127	16	315	..	15

Grand totals:—1917, 5,080; 1916, 6,107; 1915, 3,474.

GAS WELLS, 1917.

Month.	Cherokee. D.S.	Cherokee. S.S.	Cleveland.	Cushing.	Osage.	Creek.	Kay.	Healdton.	Wildcats.
January	4	..	1	3	1	14	1	3	5
February	5	..	2	1	6	16	..	..	2
March	3	..	1	2	1	12	1	1	..
April	3	2	3	1	6	15	1	2	..
May	2	..	1	3	6	32	1	..	1
June	2	..	2	3	1	17	1	..	..
July	..	..	1	2	4	11	..	..	1
August	5	..	2	..	3	3	2	1	..
September	1	..	1	2	11	22	4	3	6
October	3	1	..	1	1	22	2	1	5
November	1	..	..	1	18	24	1	1	4
December	..	2	..	1	2	22	3	2	4
Totals, 1917	29	5	14	20	60	210	17	14	28
Totals, 1916	53	19	11	42	27	168	13	4	24
Totals, 1915	75	29	7	30	26	164	6	41	2

Grand total for 1917, 397.

DRY HOLES, 1917.

Month.	Cherokee. D.S.	Cherokee. S.S.	Cleveland.	Cushing.	Osage.	Creek.	Kay.	Healdton.	Wildcats.
January	7	4	2	2	1	31	1	..	1
February	4	2	..	2	7	55	..	..	1
March	11	3	..	2	..	27	..	3	1
April	12	8	1	6	3	50	..	2	1
May	7	8	3	1	1	102	1	3	1
June	7	9	4	1	4	74	1	7	..
July	10	3	6	4	4	58	2	2	2
August	21	3	1	4	9	37	2	4	..
September	9	14	11	2	4	70	4	2	37
October	11	10	9	4	10	101	2	4	9
November	7	9	1	1	11	85	2	10	30
December	12	5	3	2	10	98	3	7	24
Totals, 1917	118	77	41	31	64	788	18	44	107
Totals, 1916	148	93	45	38	28	698	9	19	55
Totals, 1915	72	57	22	52	33	484	8	90	46

Grand total for 1917, 1,288.

ESTIMATED NEW PRODUCTION FOR 1917.

Month.	Cherokee. D. S.	Cherokee. S. S.	Cleveland.	Cushing.	Osage.	Creek.
January	570	588	925	5,150	3,145	9,948
February	709	1,210	215	6,210	1,444	20,680
March	830	1,307	245	4,310	6,456	9,807
April	964	2,155	1,405	1,645	4,080	6,370
May	854	896	1,055	1,921	4,140	8,715
June	899	800	3,240	1,260	4,507	8,334
July	1,152	813	5,235	1,310	10,490	10,585
August	1,218	790	950	1,040	4,500	18,039
September	1,784	466	1,760	1,020	3,060	10,731
October	2,181	953	1,205	515	5,395	18,194
November	1,336	810	1,193	810	7,175	10,106
December	932	1,187	680	785	3,740	11,466
Totals, 1917	13,489	11,975	18,108	25,978	57,101	142,952
Totals, 1916	17,602	14,036	5,516	230,316	18,681	135,942
Totals, 1915	5,753	7,723	1,160	633,970	11,725	62,350

Month.	Kay.	Healdton.	Garfield-Noble.	Wildcats.
January	120	2,305	.....	1,090
February	300	1,405	.....	150
March	2,300	2,240	.....	184
April	1,850	4,060	.....	100
May	450	3,870	.....	687
June	450	6,453	.....	435
July	4,500	4,390	1,160	60
August	4,250	4,225	2,350	
September	3,925	2,140	1,020	90
October	9,300	4,505	4,680	100
November	2,960	3,683	1,910	940
December	4,375	2,145	470	95
Totals, 1917	34,490	41,851	11,590	3,640
Totals, 1916	5,124	77,272	.....	2,812
Totals, 1915	1,065	64,390	.....	570

Montgomery.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January...	25	24	1	..	330
February..	32	23	2	7	348
March.....	30	18	10	2	523
April.....	29	24	4	1	276
May.....	50	43	6	1	597
June.....	40	31	6	3	427
July.....	44	35	7	2	706
August....	27	16	11	..	403
September.	35	21	11	3	227
October...	44	33	10	1	395
November..	43	35	4	4	276
December..	44	34	8	2	384
Total,'17.	443	335	80	26	4,878
Total, '16.	864	780	48	36	8,267
Total, '15.	382	200	51	131	1,689

Chautauqua.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January...	18	16	2	..	376
February..	34	26	6	2	668
March....	16	10	5	1	328
April.....	21	13	5	3	225
May.....	27	19	5	3	350
June.....	26	18	7	1	295
July.....	30	22	7	1	465
August....	12	9	3	..	278
September.	35	30	2	3	372
October....	51	38	7	6	572
November..	48	26	14	8	636
December..	48	33	11	4	1,186
Total,'17.	366	260	74	32	5,738
Total, '16.	516	439	51	20	7,447
Total, '15.	166	114	27	25	1,710

Cherokee Deep Sand.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January ..	49	35	7	4	570
February..	53	44	4	5	769
March	50	42	11	3	830
April	70	55	12	3	964
May	59	50	7	2	854
June	60	51	7	2	899
July	70	60	10	..	1,152
August ..	80	63	21	5	1,218
September.	90	86	9	1	1,784
October ..	87	73	11	3	2,181
November.	68	60	7	1	1,336
December..	91	79	12	..	932
Total,'17.	845	698	118	29	13,489
Total, '16.	1,288	1,087	148	53	17,602
Total, '15.	488	341	72	75	5,743

Cherokee Shallow Sand.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January ..	41	37	4	..	558
February..	55	53	2	..	1,210
March	38	35	3	..	1,307
April	61	51	8	2	2,155
May	48	40	8	..	890
June	44	44	8	..	800
July	69	66	3	..	813
August ..	44	41	3	..	790
September.	59	45	14	..	466
October ..	76	65	10	1	953
November.	96	87	9	..	810
December..	40	33	5	2	1,187
T'tal,'17.	679	597	77	5	11,975
Total, '16..1,213		1,101	93	19	14,036
Total, '15..	606	520	57	29	1,723

Cleveland.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January ..	24	21	2	1	925
February..	9	7	..	2	215
March	4	3	..	1	245
April	19	15	1	3	1,405
May	21	17	3	1	1,055
June	24	18	4	2	3,240
July	38	31	6	1	5,235
August ..	30	27	1	2	950
September.	29	18	10	1	1,760
October ..	30	21	9	..	1,205
November.	25	24	1	..	1,193
December..	15	11	4	..	680
Total,'17.	268	213	41	14	18,108
Total, '16..	195	139	45	11	5,516
Total, '15..	75	51	22	2	1,160

Cushing-Shamrock.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January...	30	26	2	3	5,150
February..	40	36	2	1	6,210
March	36	29	6	1	4,310
April	32	28	1	3	1,645
May	28	24	1	3	1,921
June	32	26	4	2	1,260
July	28	24	4	..	1,310
August ..	9	9	2	2	1,040
September.	12	17	4	1	1,020
October ..	17	15	1	1	515
November.	16	13	2	1	810
December..					785
Total,'17..	343	292	31	20	25,976
Total, '16..	772	692	38	42	230,316
Total, '15..1,015		944	52	19	633,970

Osage.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January...	29	27	1	1	2,145
February..	40	27	7	6	1,444
March	33	32	..	1	6,455
April	48	39	3	6	4,080
May	29	22	1	6	4,140
June	57	52	4	1	4,507
July	54	46	4	4	10,466
August ..	60	48	9	3	4,500
September.	80	65	4	11	3,060
October ..	79	68	10	1	5,395
November.	86	57	11	18	7,175
December..	55	43	10	2	3,740
Total,'17..	650	526	64	60	57,101
Total, '16..	280	225	28	27	18,681
Total, '15..	294	145	33	20	11,725

Creek Nation.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January...	197	152	31	14	9,948
February..	266	195	55	16	20,880
March	141	102	27	12	9,807
April	183	118	50	15	6,370
May	287	153	102	32	8,715
June	231	140	74	17	8,334
July	260	191	58	11	10,565
August ..	190	150	37	3	18,039
September.	254	162	70	22	10,731
October ..	453	330	101	22	18,194
November.	319	219	85	24	10,103
December..	292	172	92	22	11,466
T'tal,'17.3,073		2,075	788	210	142,952
Total, '16..2,981		2,115	698	168	135,942
Total, '15..1,770		1,127	484	159	62,350

Kay.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January...	4	2	1	1	120
February..	1	1	..	..	300
March	3	2	..	1	2,300
April	4	3	..	1	1,850
May	5	3	1	1	450
June	4	2	1	1	450
July	4	2	2	..	4,500
August ..	11	7	2	2	4,250
September.	17	9	4	4	3,935
October ..	19	15	2	2	9,300
November.	15	12	2	1	2,660
December..	21	15	3	3	4,375
Total,'17.	108	73	18	17	34,490
Total, '16.	54	32	9	13	5,124
Total, '15.	35	16	8	11	1,065

Healdton.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January...	20	17	..	3	2,305
February..	10	10	..	..	1,405
March	34	30	3	..	2,740
April	47	43	2	2	4,090
May	45	42	3	..	5,870
June	68	61	7	..	6,463
July	45	43	2	..	4,390
August ..	40	35	4	1	4,225
September.	37	32	2	3	2,140
October ..	54	49	4	1	4,505
November.	62	51	10	1	5,583
December..	45	36	7	2	2,145
Total,'17.	507	449	44	14	41,851
Total, '16.	686	663	19	4	77,272
Total, '15.	451	315	90	46	64,390

Garfield-Noble.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
July	12	10	2	..	1,160
August ..	6	6	..	..	2,350
September.	13	9	2	2	1,020
October ..	25	16	7	2	4,680
November.	15	11	3	1	1,910
December..	5	4	1	..	470
Total,'17.	76	56	15	5	11,590

Wildcats.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January...	16	10	1	5	1,090
February..	10	7	1	2	150
March	4	3	1	..	184
April	4	3	1	..	100
May	13	11	1	1	687
June	9	9	..	..	435
July	3	2	..	1	60
August ..	..	..	..	..	..
September.	47	8	35	4	99
October ..	36	31	2	3	100
November.	41	11	27	3	640
December..	33	6	23	4	98
Total,'17.	216	101	92	23	3,640

KANSAS.

Total Number of Wells Drilled 1917.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January...	171	149	19	3	17,557
February..	202	197	44	21	14,909
March	197	155	36	6	16,688
April	208	168	28	12	12,854
May	216	189	35	12	12,778
June	248	210	26	12	26,596
July	318	253	45	20	38,912
August ..	345	262	80	3	41,063
September.	323	241	57	25	60,190
October ..	445	357	63	25	43,144
November.	397	311	61	25	28,348
December..	345	270	65	10	12,722
T'tal,'17	3,495	2,762	559	174	325,465
T'tal, '16..3,640		3,167	357	116	183,343
T'tal, '15..1,123		640	139	344	7,238

Number of Wells by Counties 1917.

County.	Comp.	Oil.	Dry.	Gas.	Prod.
Montgo'ery	443	338	80	25	4,878
Chautauq'a	366	260	74	32	5,735
Butler ...1,184		1,015	148	21	294,830
Allen	238	229	6	3	2,614
Neosho ..	323	286	25	12	5,183
Wilson ..	187	142	24	21	1,587
Miami	243	163	58	22	3,715
Franklin...	249	191	43	15	2,986
Wildcats...	262	138	101	23	3,924
T'tal,'17.3,495		2,762	559	174	325,465
T'tal, '16..3,640		3,167	357	116	183,343
T'tal, '15..1,123		640	139	344	7,238

Successful Oil Wells in Kansas, 1917.

Month.	Mont-gomery.	Chau-tauqua.	Butler.	Allen.	Neosho.	Miami.	Frank-lin.	Wild-cats.	Wil-son.
January	24	16	48	20	17	8	5	12	3
February	23	26	71	22	20	8	15	6	6
March	18	10	72	13	15	6	4	11	8
April	24	13	61	8	14	13	6	25	9
May	43	19	55	21	6	8	1	31	6
June	31	18	81	16	30	7	5	10	12
July	35	22	13	13	28	20	20	6	19
August	16	9	122	41	29	17	17	14	8
September	21	30	78	2	29	30	27	2	25
October	33	38	142	22	38	24	28	5	20
November	35	26	117	27	25	9	48	12	11
December	34	33	80	24	35	18	15	15	9
Totals, 1917.....	337	290	1,015	229	286	168	191	138	142

Total number of oil wells, 2,762.

Gas Wells, 1917.

Month.	Mont-gomery.	Chau-tauqua.	Butler.	Allen.	Neosho.	Miami.	Frank-lin.	Wild-cats.	Wil-son.
January	..	..	2	..	..	..	..	1	..
February	7	2	4	..	3	..	2	1	2
March	2	1	2	..	..	..	1	..	..
April	1	3	4	..	1	2	..	2	..
May	1	3	2	..	..	1	..	4	1
June	3	1	1	..	1	..	..	4	2
July	2	1	2	1	..	3	..	1	4
August	..	..	..	..	..	..	..	..	3
September	3	3	..	2	4	9	2	..	..
October	1	0	..	..	1	8	6	2	8
November	4	8	1	..	2	4	3	2	1
December	2	4	..	..	..	..	1	2	..
Totals	25	32	21	3	12	22	15	23	21

Total number of gas wells, 174.

Totals, 1916.....	36	20	36	6	6	2	3	4	3
Totals, 1915.....	131	25	6	14	43	6	35	72	13

Dry Holes in 1917.

Month.	Mont-gomery.	Chau-tauqua.	Butler.	Allen.	Neosho.	Miami.	Frank-lin.	Wild-cats.	Wil-son.
January	1	2	4	..	..	..	..	..	13
February	2	8	18	..	..	..	3	..	15
March	10	6	..	2	4	..	4	1	7
April	4	5	6	1	3	..	2	2	5
May	6	5	11	1	2	..	..	1	8
June	6	7	6	..	1	..	2	2	2
July	7	7	22	..	3	..	2	1	5
August	11	3	32	2	3	..	4	6	18
September	11	2	7	4	1	4	19	4	5
October	10	7	17	6	2	1	4	11	6
November	4	14	10	4	1	..	13	9	8
December	3	11	15	4	5	1	6	6	9
Totals, 1917.....	80	74	148	24	25	6	58	43	101

Total number of dry holes. 559.

Totals, 1916.....	48	51	127	2	10	6	56	14	43
Totals, 1915.....	51	27	1	2	10	4	15	9	20

Estimated New Production for 1917.

Month.	Mont-gomery.	Chau-tauqua.	Butler.	Allen.	Neosho.	Miami.	Frank-lin.	Wild-cats.	Wil-son.
January	320	375	15,350	35	185	275	177	45	765
February	348	985	12,150	80	275	290	305	343	320
March	526	323	14,870	80	165	140	102	180	320
April	276	225	11,165	48	280	70	250	50	505
May	597	356	10,470	5	275	123	255	5	629
June	427	293	24,225	153	785	205	245	118	145
July	703	455	35,440	321	995	200	480	283	85
August	403	278	38,302	118	480	615	250	375	290
September	227	372	58,035	290	353	58	549	311	10
October	395	572	40,147	344	417	239	492	440	89
November	275	636	25,436	60	444	187	420	437	342
December	384	1,185	9,240	53	529	212	240	400	424
Totals, 1917.....	4,878	5,738	294,830	1,587	5,183	2,614	3,716	2,866	3,924
Totals, 1916.....	8,267	7,447	154,002	575	4,271	3,178	3,125	2,010	468
Totals, 1915.....	1,689	1,710	1,065	67	839	455	385	578	461

Butler County.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January ..	54	48	4	2	15,350
February..	93	71	18	4	12,150
March	75	72	..	3	14,870
April	71	61	6	4	11,165
May	68	55	11	2	10,470
June	88	81	6	1	24,225
July	112	80	22	2	35,440
August	154	122	32	..	38,302
September.	86	78	7	1	58,035
October ..	159	142	17	..	40,147
November.	128	117	10	1	25,436
December..	96	80	15	1	9,240
T'tal,'17.1,184		1,015	148	21	294,830
Total, '16.1,069		846	127	36	154,002
Total, '15..	23	17	1	5	1,655

Neosho County.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January...	17	17	..	..	185
February..	23	20	..	3	275
March	19	15	4	..	165
April	18	14	3	1	280
May	8	6	2	..	275
June	32	30	1	1	785
July	31	28	3	..	995
August	32	29	3	..	480
September.	34	29	1	4	353
October ..	41	38	2	1	417
November.	28	25	1	2	444
December..	40	35	5	..	529
Total,'17.	323	286	25	12	5,183
Total, '16..	252	236	10	6	4,271
Total, '15..	149	96	10	43	938

Wilson County.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January...	3	3	..	..	85
February..	8	6	..	2	80
March	10	8	2	..	80
April	10	9	1	..	48
May	8	6	1	1	5
June	14	12	..	2	153
July	23	19	..	4	321
August	13	8	2	3	118
September.	29	25	4	..	290
October ..	40	26	6	8	344
November.	19	13	4	1	60
December..	13	9	4	..	53
Total,'17.	187	142	24	21	1,587
Total, '16..	68	63	2	3	575
Total, '15..	25	10	2	13	67

Allen County.

Month.	Comp.	Oil	Dry.	Gas.	Prod.
January...	20	20	..	..	275
February..	22	22	..	..	290
March	13	13	..	..	140
April	8	8	..	..	70
May	21	21	..	..	123
June	16	16	..	..	205
July	14	13	..	1	200
August	41	41	..	..	615
September.	8	2	4	2	58
October ..	23	22	1	..	239
November.	27	27	..	..	187
December..	25	24	1	..	212
Total,'17.	238	229	6	3	2,614
Total, '16..	326	314	6	6	3,178
Total, '15..	67	49	4	14	445

TOTAL FOR 1917 IN MID-CONTINENT FIELD.

District.	Comp.	Oil.	Dry.	Gas.	Prod.
Oklahoma	6,765	5,080	1,288	397	361,172
Kansas	3,495	2,762	559	174	325,465
Arkansas	40	.....	22	18	.....
Total, 1917.....	10,300	7,842	1,869	589	686,637
Total, 1916.....	11,241	9,274	1,491	476	674,731
Total, 1915.....	5,848	4,114	1,003	731	796,634

Franklin County.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January...	6	5	..	..	45
February..	17	15	..	2	343
March	6	4	1	1	180
April	8	6	2	..	50
May	2	1	1	..	5
June	7	5	2	..	118
July	21	20	1	..	283
August	23	17	6	..	375
September.	33	27	4	2	311
October ..	45	28	11	6	449
November.	60	48	9	3	437
December..	22	15	6	1	400
Total,'17.	249	191	43	15	2,996
Total, '16..	252	235	14	3	2,910
Total, '15..	121	77	9	35	578

Miami County.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January...	3	3	..	..	177
February..	11	8	3	..	305
March	10	6	4	..	102
April	17	13	2	2	250
May	9	8	..	1	255
June	9	7	2	..	245
July	25	20	2	3	430
August	21	17	4	..	250
September.	58	30	19	9	549
October ..	31	24	4	3	492
November.	25	9	12	4	420
December..	24	18	6	..	240
Total,'17.	243	163	58	22	3,715
Total, '16..	275	217	56	2	3,125
Total, '15..	56	35	15	6	385

Wildcats.

Month.	Comp.	Oil.	Dry.	Gas.	Prod.
January...	26	12	13	1	765
February..	22	6	15	1	320
March	16	11	7	..	320
April	32	25	5	2	505
May	43	31	8	4	629
June	16	10	2	4	145
July	18	6	5	7	80
August	22	14	18	..	280
September.	6	1	5	..	10
October ..	11	5	6	..	89
November.	22	12	8	2	342
December..	26	15	9	2	424
Total,'17.	262	138	101	23	3,924
Total, '16..	84	37	43	4	468
Total, '15..	134	42	20	72	461

ARKANSAS.

Crawford County.

Month.	Comp.	Dry.	Gas.
January	8	1	7
February	2	1	1
March	2	1	1
April	5	4	1
June	4	3	1
September	1	1	..
Total, 1917.....	22	11	11

Franklin County.

Month.	Comp.	Dry.	Gas.
January	1	1	..
March	1	1	..
Total, 1917.....	2	2	..

Independence County.

Month.	Comp.	Dry.	Gas.
January	3	3	..

Miscellaneous.

Month.	Comp.	Dry.	Gas.
February	5	5	..
May	2	1	1
November	6	..	6
Total, 1917.....	13	6	7

Completions by Months, 1917.

Month.	Comp.	Dry.	Gas.
January	12	5	7
February	7	6	1
March	3	2	1
April	5	4	1
May	2	1	1
June	4	3	1
September	1	1	..
November	6	..	6
Total, 1917.....	40	22	18

Completions by Counties, 1917.

County.	Comp.	Dry.	Gas.
Crawford	22	11	11
Franklin	2	2	..
Independence	3	3	..
Miscellaneous	13	6	7
Total, 1917.....	40	22	18

ARKANSAS GAS PRODUCTION.

January.

County.	Cubic Feet.
Crawford	15,000,000

February.

County.	Cubic Feet.
Crawford	3,000,000

March.

County.	Cubic Feet.
Crawford	1,000,000

April.

County.	Cubic Feet.
Crawford	2,500,000

May.

County.	Cubic Feet.
Van Buren.....	2,500,000

June.

County.	Cubic Feet.
Crawford	8,000,000

Note.—After June there were no gas completions n the Arkansas district.

Year's Gas Output by Months.

Month.	Cubic Feet.
January	15,000,000
February	3,000,000
March	1,000,000
April	2,500,000
May	2,500,000
June	8,000,000
Total	32,000,000

Gas Volume by Counties.

County.	Cubic Feet.
Crawford	29,500,000
Van Buren.....	2,500,000
Total	32,000,000

MORE THAN TWO AND ONE-HALF BILLION FEET OF GAS OUTPUT IN MID-CONTINENT

Of This Amount Oklahoma Produced 2,293,850,000 Cubic Feet; Kansas, 214,750,000, and Arkansas 32,000,000 Cubic Feet.

During the year 1917 in the mid-continent field, the total gas volume was 2,540,600,000 cubic feet, the volume being taken from the initial gauge of each well. Of the above amount the Oklahoma district was credited with 2,293,850,000 cubic feet, Kansas coming next with 214,750,000 cubic feet, followed by Arkansas with 32,000,000 cubic feet. These are the only figures prepared on the gas output during the year past, most people overlooking the gas end, which is just as important as the oil.

Creek Nation Leads.

As usual the Creek Nation in Oklahoma was the leading gas production section of the mid-continent field, being credited with 1,090,500,000 cubic feet. This takes in the long strip of territory from Tulsa south to McIntosh county and a locality that has produced some remarkable gas wells. Following this came the Osage with 262,000,000 cubic feet. Kay county, which is also one of the leading gas producing sections of the State, was third with 222,250,000 cubic feet. The smallest gas volume of the year was from the Cherokee shallow sand districts of Nowata county, which had 7,400,000 cubic feet for the entire twelve months. The Fox development, in Stephens county, also produced some remarkable gas wells and the coming year will show a large increase in this district.

Butler County, Kansas.

Kansas has not boasted of any great gas wells during the past several years, but it occasionally produces some good ones for that State, which can not be compared to the Oklahoma wells in size. The best producing section of the State during the year just passed was in the Butler county district where the gas volume amounted to 73,500,000 cubic feet. The next was in the wildcat area which showed 30,700,000 cubic feet on initial gauge, and then came Chautauqua county, with 30,650,000 cubic feet. The smallest gas volume was uncovered in Allen county—1,000,000 cubic feet.

In Arkansas.

In Arkansas but 32,000,000 cubic feet of gas was uncovered, it all being found during the first six months of the year, there being no gas wells finished during the last half of the year. Crawford county showed 29,600,000 cubic feet of the volume and Van Buren was the only other county to show any gas volume, it having 2,500,000 cubic feet.

Following will be found the gas volume uncovered in the mid-continent field during the year 1917, showing the volume by months and by each district in Oklahoma, Kansas, and Arkansas:—

Mid-Continent Gas Output for 1917.

State.	Cubic feet.
Oklahoma	2,293,850,000
Kansas	214,750,000
Arkansas	32,000,000
Total	2,540,600,000

OKLAHOMA.

Yearly Gas Output by Months.

Months.	Cubic feet.
January	129,500,000
February	177,500,000
March	164,000,000
April	224,500,000
May	340,000,000
June	171,500,000
July	80,000,000
August	51,250,000
September	209,000,000
October	177,900,000
November	212,700,000
December	356,000,000
Total	2,293,850,000

Yearly Gas Output by Districts.

District.	Cubic feet.
Cherokee deep sand	83,500,000
Cherokee shallow sand	7,400,000
Osage	262,000,000
Cleveland	103,500,000
Cushing-Shamrock	157,200,000
Creek	1,090,500,000
Kay	222,250,000
Healdton	153,000,000
Wildcats	214,500,000
Total	2,293,850,000

OKLAHOMA GAS PRODUCTION.

January.

District.	Cubic feet.
Cherokee deep sand	19,000,000
Osage	4,000,000
Cleveland	2,000,000
Cushing-Shamrock	12,000,000
Creek	47,500,000
Kay	20,000,000
Healdton	16,000,000
Wildcats	9,000,000
Total	129,500,000

February.

District.	Cubic feet.
Cherokee deep sand	7,000,000
Osage	12,500,000
Cleveland	6,000,000
Cushing-Shamrock	15,000,000
Creek	112,000,000
Wildcats	25,000,000
Total	177,500,000

March.

District.	Cubic feet.
Cherokee deep sand	6,000,000
Osage	4,000,000
Cleveland	24,000,000
Cushing-Shamrock	36,000,000
Creek	73,000,000
Kay	15,000,000
Healdton	1,000,000
Total	164,000,000

April.

District.	Cubic feet.
Cherokee deep hand	13,000,000
Cherokee shallow sand	7,000,000
Osage	49,000,000
Cleveland	45,000,000
Cushing-Shamrock	12,000,000
Creek	62,500,000
Kay	20,000,000
Healdton	16,000,000
Total	224,500,000

May.

District.	Cubic feet.
Cherokee deep sand	2,000,000
Osage	16,000,000
Cleveland	7,000,000
Cushing-Shamrock	21,000,000
Creek nation	280,000,000
Kay	8,000,000
Wildcats	6,000,000
Total	340,000,000

June.

District.	Cubic feet.
Cherokee deep sand	17,500,000
Osage	1,000,000
Cleveland	14,000,000
Cushing-Shamrock	24,000,000
Creek	90,000,000
Kay	25,000,000
Total	171,500,000

July.

District.	Cubic feet.
Osage	17,500,000
Cleveland	2,500,000
Cushing-Shamrock	11,000,000
Creek	44,000,000
Wildcats	5,000,000
Total	80,000,000

August.

District.	Cubic feet.
Cherokee deep sand	3,000,000
Osage	7,000,000
Cleveland	3,000,000
Creek	30,000,000
Healdton	2,000,000
Kay	6,250,000
Total	51,250,000

September.

District.	Cubic feet.
Cherokee deep sand	4,000,000
Osage	51,000,000
Cushing-Shamrock	10,000,000
Creek	71,500,000
Kay	16,000,000
Healdton	26,000,000
Wildcats	30,500,000
Total	209,000,000

October.

District.	Cubic feet.
Cherokee deep sand	10,000,000
Cherokee shallow sand	400,000
Osage	30,000,000
Cushing-Shamrock	10,000,000
Creek	75,500,000
Kay	30,000,000
Healdton	12,000,000
Wildcats	6,000,000
Total	177,900,000

November.

District.	Cubic feet.
Cherokee deep sand	1,000,000
Osage	60,000,000
Cushing-Shamrock	700,000
Creek	105,000,000
Kay	13,000,000
Wildcats	33,000,000
Total	212,700,000

December.

District.	Cubic feet.
Cherokee deep sand	1,000,000
Osage	10,000,000
Cushing-Shamrock	5,000,000
Creek	91,000,000
Kay	69,000,000
Healdton	80,000,000
Wildcats	100,000,000
Total	356,000,000

KANSAS.

Yearly Gas Output by Months.

Months—	Cubic Feet.
January	4,000,000
February	20,000,000
March	22,000,000
April	17,000,000
May	22,500,000
June	10,000,000
July	26,500,000
August	3,900,000
September	48,500,000
October	22,400,000
November	9,950,000
December	8,000,000
Total	214,750,000

Yearly Gas Output by Counties.

Counties—	Cubic Feet.
Montgomery	22,500,000
Chautauqua	30,650,000
Butler	73,500,000
Wilson	17,750,000
Allen	1,000,000
Neosho	5,250,000
Miami	13,500,000
Franklin	20,150,000
Wildcats	30,700,000
Total	214,750,000

KANSAS GAS PRODUCTION.

January.

County—	Cubic Feet.
Butler	3,000,000
Wildcats	1,000,000
Total	4,000,000

February.

County—	Cubic Feet.
Butler	6,500,000
Chautauqua	1,250,000
Franklin	1,500,000
Montgomery	6,250,000
Neosho	2,000,000
Wilson	500,000
Wildcats	2,000,000
Total	20,000,000

March.

County—	Cubic Feet.
Butler	15,000,000
Chautauqua	2,000,000
Franklin	2,000,000
Montgomery	3,000,000
Total	22,000,000

April.

County—	Cubic Feet.
Butler	5,000,000
Chautauqua	3,000,000
Miami	3,000,000
Montgomery	1,000,000
Neosho	500,000
Wildcats	4,500,000
Total	17,000,000

May.

County—	Cubic Feet.
Butler	10,000,000
Chautauqua	5,000,000
Miami	1,000,000
Montgomery	1,000,000
Wilson	500,000
Wildcats	5,000,000
Total	22,500,000

June.

County—	Cubic Feet.
Butler	500,000
Chautauqua	2,500,000
Montgomery	1,500,000
Neosho	500,000
Wilson	1,000,000
Wildcats	4,000,000
Total	10,000,000

July.

County—	Cubic Feet.
Montgomery	750,000
Chautauqua	1,000,000
Butler	7,000,000
Wilson	3,000,000
Allen	1,000,000
Miami	1,750,000
Wildcats	12,000,000
Total	26,500,000

August.

County—	Cubic Feet.
Montgomery	400,000
Chautauqua	1,000,000
Wilson	2,500,000
Total	3,900,000

September.

County.	Cubic Feet.
Montgomery	7,250,000
Chautauqua	6,000,000
Butler	23,000,000
Neosho	2,000,000
Franklin	2,500,000
Miami	7,750,000
Total	48,500,000

October.

County.	Cubic Feet.
Montgomery	100,000
Chautauqua	3,900,000
Franklin	9,150,000
Wilson	9,250,000
Total	22,400,000

November.

County.	Cubic Feet.
Montgomery	500,000
Chautauqua	3,000,000
Butler	2,000,000
Franklin	3,000,000
Neosho	250,000
Wilson	1,000,000
Wildcats	200,000
Total	9,950,000

December.

County.	Cubic Feet.
Montgomery	500,000
Chautauqua	2,000,000
Butler	1,500,000
Franklin	2,000,000
Wildcats	2,000,000
Total	8,000,000

PETROLEUM REFINERIES IN OKLAHOMA AND KANSAS, COMPLETED AND BUILDING, 1917

Company and location.	Year built.	Approximate investment.	Approximate barrels of crude daily.
Cosden & Co., West Tulsa	1913	$35,000,000	13,000
Cosden & Co., Cushing	1911		2,000
Empire Refineries, Okmulgee	1907		4,000
Empire Refineries, Cushing	1912		3,250
Empire Refineries, Oklahoma City	1906	12,500,000	2,000
Empire Refineries, Cushing	1914		3,000
Empire Refineries, Ponca City	1912		3,500
Sinclair Oil and Refining Co., Cushing	1914		4,500
Sinclair Oil and Refining Co., Muskogee	1905	72,500,000	500
Sinclair Oil and Refining Co., Vinita	1910		6,000
Carter Oil Co., Norfolk	1916	3,500,000	18,000
Crystal White Refining Co., Allen	1915	25,000	175
Ardmore Refining Co., Ardmore	1914	200,000	4,528
Bigheart Petroleum Refining Co., Bigheart	1908	100,000	800
Boynton Refining Co., Boynton	1916	90,000	1,000
Continental Refining Co., Bristow	1914	275,000	1,500
Consolidated Oil Refining Co., Cleveland	1913	85,000	650
Consumers Refining Co., Cushing	1913	1,150,000	5,000
Hillman Refining Co., Cushing	1914	27,000	450
International Refining Co., Cushing	1915	300,000	4,365
Illinois Oil Co., Cushing	1914	175,000	2,000
Roxana Petroleum Co., Cushing	1916	1,250,000	10,000
Lawton Refining Co., Lawton	1916	27,000	400
Muskogee Refining Co., Muskogee	1905	1,250,000	1,500
Atwood Refining Co., Oklahoma City	1915	50,000	1,000
Indiahoma Refining Co., Okmulgee	1910	1,258,000	3,750
Lake Park Refining Co., Okmulgee	1915	40,000	800
Sapulpa Refining Co., Sapulpa	1908	2,000,000	5,500
Phoenix Refining Co., Sand Springs	1913	350,000	3,500
Pierce Oil Corporation, Sand Springs	1913	1,250,000	5,000
North American Refining Co., Pemeta	1915	200,000	2,000
Constantin Refining Co., West Tulsa	1911	450,000	5,300
Pan-American Refining Co., West Tulsa	1916	275,000	2,500
The Texas Co., West Tulsa	1910		8,500
Uncle Sam Oil Co., West Tulsa	1906	50,000	600
Southern Oil Corporation, Yale	1915	700,000	4,500
*Mid-Continent Gasoline Co., West Tulsa	1916	150,000	2,000
Economy Refining Co., Blackwell	1916	120,000	1,500
*Central Refining Co., Drumright	1917	15,000	300
Crescent Refining Co., Newkirk	1917	200,000	3,000
*Cushing Petroleum Producing Co., Cushing	1917	30,000	450
Dean Oil Co., Cushing (cracking)	1916	25,000	Idle
Interstate Oil Refining Co., Drumright	1917		
Duluth Refining Co., Sapulpa	1917	175,000	3,000
Home Oil Refining Co., Yale	1916	40,000	500
Inland Refining Co., Cushing	1917	350,000	2,500
McKirchner Refining Co., Jennings	1917	50,000	600
Oilton Refining Co., Oilton	1917	15,000	500
Okmulgee Producing and Refining Co., Okmulgee	1916	200,000	1,500
Oneta Refining Co., Oneta	1917	40,000	500
Katy Refining Co., Yale	1916	15,000	200
Star Refining Co. (Interstate), Yale	1916	16,000	600
Wilson Refining Co., Wilson (Healdton)	1917	20,000	1,000
Yale Oil Refining Co., Yale	1916	30,000	1,500
Canfield Refining Co., Yale	1917	250,000	1,000
Enid Refining Co., Enid	1917	75,000	1,500
Gotebo Refining Co., Gotebo	1917	10,000	100
Great American Refining Co., Jennings	1917	150,000	1,500
Home Oil Co., Oklahoma City	1917	500,000	2,500
Webster Oil and Gasoline Co., Yale	1915	80,000	800
Superior Refining Co., Yale	1916	21,000	100
*Process Refining Co., Cushing	1917	20,000	600
Wabash Refining Co., Sand Springs	1917	250,000	5,000
*White Star Refining Co., West Tulsa	1917	100,000	1,500
*Holly & Owens, Cushing	1917	15,000	600
*Imperial Refining Co., Ardmore	1917	20,000	1,000
Osage Refining Co., Hominy	1917	30,000	1,000
Navanza Refining Co., New Wilson	1917	50,000	1,400
Allied Refining Co., Okmulgee (starting)	1917		

*Use distillate instead of crude.

Ames Refining Co., Eagle Refining Co., H udson Refining Co., Cushing, small plants trying out Parker process.

Building or Projected.

Victor Refining Co., Sapulpa	1917	100,000	1,000
Miami Refining Co., Quapaw	1917	40,000	200
Superior Refining Co., Enid (building)	1917		
W. D. Richardson, Ponca City (building)	1917		
Mohawk Refining Co., Sand Springs (building)	1917		
Peoples Refining Co., Ringling	1917	50,000	500
Garr et al., Covington	1917	50,000	500
Nupro Refining Co., Muskogee	1917	50,000	800
Osage Mutual Refining Co., Pawhuska (building)	1917		
Birmingham Oil and Gas, Muskogee	1917	1,000,000	
Bixby Oil and Refining Co., Bixby	1917	200,000	2,000
Bliss Oil and Refining Co., Tulsa	1917	3,000,000	
Brazilian Oil and Refining Co., Tulsa	1917	100,000	
Bu-Co Oil and Refining Co., Enid	1917	10,000	
Corton Oil and Refining Co., Oklahoma City	1917	100,000	
Federal Refining Co., Tulsa	1917	50,000	
Great Central Refining Co., Claremore	1917	500,000	
Greater Oil and Gas Manufacturing Co., Ada	1917	600,000	
Globe Oil and Refining Co., Enid	1917	500,000	5,000
Haskell Refining Co., Muskogee	1917	150,000	
Henryetta Refining Co., Henryetta	1917	10,000	
North Iowa Oil and Refining Co., Lawton	1917	50,000	
Nowata Oil Refining Co., Nowata	1917	500,000	
Odessa Oil and Refining Co., Jennings	1917	100,000	
Jayhawker Gasoline Co., Tulsa	1917	100,000	
Kingsmith Refining Co., Tulsa	1917		
Major Refining Co., Boynton	1917		
Oklahoma Prod. & Gas. Co., West Tulsa. (Pitt man).	1917		
Petrol Refining Co., Yale	1917	30,000	
Paramount Oil and Refining Co., Sapulpa	1917		

Pyramid Refining Co., Oklahoma City	1917	100,000	....
Security Refining Co., Oklahoma City	1917	150,000	....
Shawnee Refining Co., Shawnee	1917	100,000	....
Triangle Oil Refining Co., New Wilson	1917	35,000	....
Wallace Refining Co., Oklahoma City	1917	50,000	....
Oil Refinery, Drumright (German)	1917	250,000	....
Dancinger Oil and Refining Co., Drumright	1917	20,000	....
Denver Prod. and Ref. Co., Okmulgee (Shreves)	1917	.....	....
Chenning Refining Co., Cushing	1917	20,000	....
Dilworth Oil and Refining Co., Newkirk	1917	.....	....
Forty-six Star Refining Co., Healdton	1917	.....	....
Southwestern Oil Corporation, Enid	1917	.....	....
Tri-County Oil and Gas Co., Cushing	1917	.....	....
Western Producing and Refining Co., Tulsa	1917	1,000	....
Great Western Refining Co., Ardmore	1917	.....	1,000
Chickasha Refining Co., Ardmore	1917	.....	2,000
Cameron Refining Co., Ardmore	1917	.....	1,000
Forty-six Refining Co., Healdton	1917	250,000	2,500
Henryetta Oil and Refining Co., Henryetta	1917	350,000	....
Producers and Refiners, Blackwell	1917	.....	....
Modern Refining Co.	1917	.....	1,000
Wabash Refining Co., Hominy	1917	.....	1,500
Equality Refining Co., Oilton	1917	.....	5,000

Petroleum Refineries in Kansas.

Company and location.	Year built.	Approximate investment.	Approximate barrels of crude daily.
Standard Oil Co. of Kansas, Neodesha	1892	$5,250,000	9,000
Lesh Refining Co., Arkansas City	1914	300,000	1,200
Kanotex Refining Co., Arkansas City	1906	700,000	350
Milliken Refining Co., Arkansas City	1917	1,150,000	6,000
Sinclair Refining Co., Chanute	1907	.....	2,200
Kansas Co-Operative Refining Co., Chanute	1906	200,000	800
Morgan Refining Co., Chanute	1904	6,000	50
Uncle Sam Oil Co., Cherryvale	1906	125,000	500
Sinclair Refining Co., Coffeyville	1909	.....	4,500
Sinclair Refining Co., Argentine	1917	.....	4,500
Kansas Oil Refining Co., Coffeyville	1906	350,000	1,250
National Refining Co., Coffeyville	1907	525,000	4,600
Great Western Oil Refining Co., Erie	1906	754,000	500
Miller Petroleum Refining Co., Humboldt	1906	73,626	505
Hutchinson Refining Co., Hutchinson	1915	125,000	1,500
Kansas City Refining Co., Kansas City	1906	300,000	2,700
O. K. Refining Co., Niotaze	1906	400,000	1,200
Commonwealth Oil and Refining Co., Moran	1905	350,000	300
Rosedale Refining Co., Rosedale	1915	75,000	500
Wichita Ind. Oil and Ref. Co., Wichita	1914	15,000	500
Wichita Ind. Oil and Ref. Co. (Sterling) Wichita.	1917	200,000	4,000
El Dorado Refining Co., El Dorado	1916	250,000	2,000
General Refining Co. (Uncle Sam), Kansas City	1909	100,000	800
Evans-Thwing Refining Co., Wichita	1917	350,000	3,000
Empire Refineries (Sarco), Independence	1909	.....	3,500
Midland Refining Co., El Dorado	1917	250,000	4,000
White Eagle Refining Co., Augusta	1917	750,000	5,000
Western Refining Co., Wichita	1917	35,000	800
Golden Rule Refining Co., Wichita	1917	35,000	500
Walnut River Refining Co., Augusta	1916	125,000	1,500
Building or Projected.			
Wright Producing and Refining Co., Cherryvale	1917	100,000	1,000
Red Ball Oil and Refining Co., Ottawa	1917	75,000	1,000
Piper & Boleno, El Dorado	1917	100,000	1,000
Augusta Refining Co., Augusta	1917	200,000	3,000
H. T Lynch & Co., El Dorado	1917	200,000	3,000
Oklamade Oil Refining Co., Rantoul	1917	100,000	1,000
Trapshooters' Refining Co., El Dorado	1917	100,000	1,000
Bliss Refining Co., El Dorado	1917	100,000	1,000
Bliss Refining Co., Augusta	1917	100,000	1,000
Fidelity Refining Co., El Dorado	1917	300,000	3,000

NAMES AND SUBSIDIARIES OF SO-CALLED BIG OIL COMPANIES IN WESTERN FIELDS

The names and subsidiaries of the leading or so-called big oil companies operating in Oklahoma, California, Wyoming, Kansas and Texas and the amount of oil produced by each of them during the last fiscal or calendar year will be found in the following table:—

Company.	Relation to other companies.	Approximate production for 1917. Barrels.
Oklahoma.		
Cosden Oil & Gas Co.	Presumably independent. Some of its affiliated companies are Cosden & Co., Cosden Pipeline Co., Glenn Pool Pipeline Co., Union Petroleum Co., Pen-Mar Oil Co.	.....
Prairie Oil & Gas Co.	One of the Standard Oil group and was a subsidiary of Standard Oil of New Jersey until it was separated therefrom by dissolution decree of the United States Supreme Court in 1911	6,747,420
Sinclair Oil & Gas Co.	An independent company which has acquired a large number of smaller producers. The Sinclair Oil and Sinclair Gulf are co-interests	4,250,000
Roxana Petroleum Co.	A subsidiary of the Royal Dutch Shell group	3,505,000
Gypsy Oil Co.	Held by Gulf Oil Corporation, an independent	4,044,708
Empire Gas & Fuel Co.	Affiliated with the Empire Refineries, Inc. Is an independent concern	450,000
Barnsdall Oil Co.		1,575,000
Quaker Oil & Gas Co.	Originally controlled by Pure Oil Co. Now controlled by Ohio Cities Gas Co.	.....
Ohio Cities Gas Co.	An independent organization. Has a number of subsidiaries, some of which are the Ardmore Refining Co., International Refining Co., Pure Oil Co., Cornplanter Refining Co., and Quaker Oil & Gas Co.	2,572,400
The Carter Oil Co.	Owned by Standard Oil Co. of New Jersey	2,636,000
Magnolia Petroleum Co.	Commonly known as a Standard Oil Company	5,110,000
McMan Oil Co.	Sold a controlling interest to the Magnolia Petroleum Co. several months ago	.....
Producers Oil Co.	Has been absorbed by the Texas Co., 20 per cent. of the stock of which the Federal Trade Commission states is owned by the stockholders of different Standard Oil companies	.....
Monitor Oil & Gas Co.	An independent company so far as known to this department	*1,078,000
Silurian Oil Co.	An independent organization so far as is known	642,000
Tidal Oil Co.	Principally owned by Tide Water Oil Co., some of the stock of which is held by stockholders in the Standard Oil Co., though it is understood that the Tide Water Oil Co. is not controlled by the Standard	3,607,000
J. W. Gilliland	This is an independent operator	†649,669
Kansas.		
Sinclair Oil & Gas Co.	See Oklahoma, table preceding	1,350,000
Gypsy Oil Co.	See Oklahoma, table preceding	2,608,000
Producers Oil Co.	See Oklahoma, table preceding	.....
Magnolia Petroleum Co.	See Oklahoma, table preceding	365,000
J. W. Gilliland	See Oklahoma, table preceding	423,781
Tidal Oil Co.	See Oklahoma, table preceding	171,000
Carter Oil Co.	See Oklahoma, table preceding	4,010,000
Monitor Oil & Gas Co.	See Oklahoma, table preceding	532,000
Prairie Oil & Gas Co.	See Oklahoma, table preceding	572,134
Empire Gas & Fuel Co.	See Oklahoma, table preceding	12,600,000
Mid-Kansas Oil & Gas Co.	See Oklahoma, table preceding	.....
Texas.		
Magnolia Petroleum Co.	See Oklahoma, table preceding	2,053,500
Producers Oil Co.		.....
Gulf Production Co.	Owned by the Gulf Oil Corporation, which is considered an independent	7,027,221
Republic Production Co.	A newly organized company in Texas and is believed to be independent	1,720,000
Invincible Oil Co.	This is an independent, so far as known	676,000
The Sun Co.	A close corporation and its connection to other companies is unknown to the department	638,960
Humble Oil & Refining Co.	An independent organization	2,550,000
Wyoming.		
Midwest Oil Co.		1,536,745
Ohio Oil Co.	One of the Standard Oil group	1,752,572
Wyoming Oil Fields Co.	The affiliations of this company are not known	1,097,986
California.		
St. Helens Petroleum Co.		795,000
Kern River Oil Fields Co.		672,500

*Includes 141,694 barrels belonging to Magnolia Petroleum Company produced from jointly owned leases.

†Includes also Reese Oil Company, Tulsa Oil Company and Oklahoma State Oil Company.

Amalgamated Oil Co.	The Amalgamated Oil Co., the Arcturus Oil Co. and the Salt Lake Oil Co. are affiliated and controlled by the Associated Oil Co., which in turn is controlled by the Kern Trading & Oil Co., the producing company of the Southern Pacific Railroad	‡1,479,432
Kern Trading & Oil Co.	A producing company for the Southern Pacific R. R.	9,390,870
Associated Oil Co.	Controlled by the Kern Trading & Oil Co.	7,266,096
Honolulu Consolidated		1,440,000
Shell Co. of California	A subsidiary of the Royal Dutch Shell group	6,292,995
Belridge Oil Co.		978,991
Union Oil Co. of California		7,000,000
General Petroleum Corp.	An independent company	4,700,000
Pan-American Petroleum & Transport Co.	One of the Doheny interests, presumably with no Standard Oil relations	587,387
Standard Oil Co. (California)	One of the Standard Oil group	18,283,567

‡ Includes Arcturus Oil Company and Salt Lake Oil Company.

Kansas and Oklahoma Gasoline Plants, 1917.

Owner and location.	Daily capacity gallons
Chestnut & Smith interests (including) Chestnut & Smith, Victor Gasoline Co., Moon Gasoline Co., Jefferson Gasoline Co., Barco Gasoline Co., and Kingsmith Refining Co., plants at Glenn Pool (9), Morris (2), Beggs (2), Drumright (2), Muskogee (2), Cushing (3), Preston and Kelleyville; total production	78,000
Gypsy Oil Co., 4 plants, at Kiefer, Jenks, Cleveland and Drumright	53,000
Riverside Western Oil Co., 7 plants, at Morris, Eram, Bald Hill, Nowata, Delaware, Alluwe and Coody's Bluff	30,000
Mid-Co. Gasoline Co., 4 plants, at Adair, Oilton, Wann, Dewey	17,000
Oklahoma Petroleum & Gasoline Co., 20 plants, at Mohawk, Haywood Spur, Jenks, Cleveland, Standard Spur, Glenn Pool (9), north extension of Glenn Pool (4), Chelsea (2) and Bixby	45,000
Producers' Oil Co., 3 plants, at Bald Hill, Glenn Pool and Drumright	14,000
Sinclair Oil & Gasoline Co., 1 plant in operation at Cleveland and 4 plants near completion at Drumright, Shamrock, Bald Hill and Stone Bluff, prospective production	23,500
Standard Oil Co. of Indiana, plants at Drumright (2), Oilton and Cushing	40,000
Tidal Gasoline Co., plants at Drumright (2), Ocheleta, Coalton and Nowata	10,800
Crosbie & Gillespie, Kiefer	9,000
Henderson Gasoline Co., Childers	16,000
Cosden Oil & Gas Co., Shamrock	8,000
Liquefied Petroleum Gas Co., 5 plants at Chelsea	5,000
Diamond Gasoline Co., Delaware	8,000
A. C. F. Gasoline Co., Oilton	2,000
Akin Gasoline Co., Dewey & Bixby	2,750
Altena Oil Co., Chelsea	2,700
Arrow Gasoline Co., Broken Arrow	600
Arthur Oil Co., Sapulpa	600
Barmont Oil Co., Drumright	250
Boynton Gasoline Co., Boynton	4,000
Bradstreet & Co., Muskogee	250
Brighton Gasoline Co., Bald Hill	1,000
Carter Oil Co., Boynton	2,750
Chestnut & Fitzgerald, Watkins	600
Cont. Gas Compressing Co., Lenepah	1,100
Crystal Gasoline Co., Bald Hill	1,300
B. T. Curley, Coalton	200
De Soto Gasoline Co., Wann	3,000
Dewey Portland Cement Co., Dewey	600
Eagle Gasoline Co., Watkins	1,100
Goodwell Oil Co., Muskogee	250
D. W. Franchot & Co., Kiefer	1,000
Glenn Gas Co., Kiefer	1,100
Hillman Refining Co., Cushing	500
Hi Grade Pet. & Gasoline Co., Stone Bluff	1,200
Hays Gasoline Co., Boynton	1,100
Imperial Gasoline Co., Drumright	2,000
Piedmont Petroleum & Gasoline Co., Broken Arrow	1,100
B. B. Jones, Oilton	500
Max Rhea Gasoline Co., Sapulpa	600
McMan Gasoline Co., Drumright	600
Misener Gasoline Co., Broken Arrow	500
Monarch Gasoline Co., Watkins	1,100
Motor Gasoline Co., Muskogee	1,100
National Products Co., plants at Oilton, Mounds and Cleveland	1,500
Ohio Cities Gasoline Co., Drumright	3,000
Oil State Gasoline Co., Jenks	2,500
Osage Gasoline Co., Ocheleta	2,750
Pulaski Refining Co., Turkey Mountain	700
Persian Oil Co., Muskogee	250
Pine Pool Gasoline Co., Okmulgee	600
Red Demon Gasoline Co., Muskogee	800
Richards Gasoline Co., Sapulpa	600
C. B. Shafer, Cushing	600
Smith & Swan Gasoline Co., Bartlett	600
Southland Gas Co., Oilton	3,000
Southern Gas Co., Okmulgee	600
T. B. Gasoline Co., Alluwe	4,000
Tulsa Gasoline Co., Glenn Pool	600
Tibbens Gasoline Co., Okmulgee	1,000
Una Gasoline Co., Chelsea	1,200
Whitfield Sears Oil Co., Muskogee	250
Wolverine Oil Co., Bartlesville	5,000
Sedan Gasoline Co., Sedan, Kans.	1,000
Mileage Gasoline Co., plants at Bartlett (2), Lost City and Haskell	7,000
Bluff Gasoline Co., Sapulpa	200
Cinco Oil Co., Chelsea	500
Childers Gasoline Co., Nowata	500
Twin Hill Gasoline Co., Bald Hill	600
Magnolia Gasoline Co., plants at Okmulgee, Healdton, Cushing (4)	4,500
Magnolia Pet. Co., Healdton	3,000
Hays Gasoline Co., Boynton (700,000 cu. ft.)	1,000
Boynton Gasoline Co., Boynton (1,500,000 cu. ft.)	3,000
Silver Gasoline Co., Vega (1,250,000 cu. ft.)	....
Hi Grade Gasoline Co., Avant (1,000,000 cu. ft.)	1,200
Hi Grade Gasoline Co., Stone Bluff (2,000,000 cu. ft.)	5,000
Heva Gasoline Co., Kelleyville (1,000,000 cu. ft.)	....
Chieftain Gasoline Co., Oilton (1,500,000 cu. ft.)	....
Commerce Gasoline Co., Sapulpa (500,000 cu. ft.)	1,000
Hesco Gasoline Co., Drumrght (600,000 cu. ft.)	....
Union Skiatook Gasoline Co., Skiatook (1,000,000 cu. ft.)	....
Marland Refining Co. (1,750,000 cu. ft.)	6,000
Marland Refining Co., Mervine Field	3,000
Livingston Oil Corporation, Bixby (500,000 cu. ft.)	....
Bankers Oil Co., Rantoul, Kan. (300,000 cu. ft.)	....
Frank Phillips, Bartlesville (1,250,000 cu. ft.)	2,500
Mileage Gasoline Co., 4 plants, at Red Fork, Haskell, Bartlett (2)	....
Gypsy Oil Co., Shamrock (3,000,000 cu. ft.)	....
Gypsy Oil Co., near Cleveland (700,000 cu. ft.)	....
Oklahoma Petroleum & Gasoline Co., Wateva	....
Mid-Co. Petroleum & Gasoline Co., plants at Bartlesville (4), Oilton and Drumright	12,000
Chestnut & Smith, plants at Bartlesville (2) and Peru	....
W. G. Skelly, Sapulpa (300,000 cu. ft.)	....
The Three Gasoline Co., Bixby (750,000 cu. ft.)	....
Tidal Gasoline Co., Nowata (350,000 cu. ft.), and addition at Coalton	1,400
Rotary Gasoline Co., Sperry (360,000 cu. ft.)	....
Magnolia Gasoline Co., Shamrock (1,250,000 cu. ft.)	....
Jayhawker Gasoline Co., 2 plants	....
Sterling Gasoline Co., Boynton	....
Superior Oil & Gas Co., Healdton, Gates Oil Co., Healdton, Black Hawk Petroleum Co., Stone Bluff	45,000

TEXAS-PANHANDLE 1917 PRODUCTION RECORD GREATER THAN EVER BEFORE

Monthly Output Now Exceeds Million Barrels—New Sand at Brownwood Brings Up Total Production at Close of Year.

A review of the Panhandle-Northern Texas fields during 1917 shows conclusively that it only a question of time, labor, material and water supplies until the vast area covered by the Panhandle section will be one vast oil and gas field. That Texas some day will be the greatest oil-producing State in the Union is without doubt. Thousands upon thousands of wells have already been drilled in the State, but only a small portion has been scratched with the drill. Development work for petroleum will no doubt be carried on in all sections of the State where the drill never before has been seen, and the year of 1918 will no doubt be the start of a drilling compaign clear across the many counties within its borders. Only the east half of the State has been given a certain amount of test work, and less than one-half the counties have even seen a drill in it, and these counties are sure to be tested out before many years have passed, as the oil question and supply is becoming a grave one.

If the war keeps up for any length of time, a large additional amount of crude oil and its products will be badly needed, and should the war close within a short time, the United States will be looked upon to furnish the world's supply of products from the raw material for a number of years, or until the foreign fields are put back in the shape they were in a few years ago. Texas is destined to be one of the leadings pokes in the petroleum industry, and the average oil man realizes this, and is working accordingly. Millions of acres are being taken under long leases, especially in the western and northwestern section, which was at one time the famous grazing fields of Texas. The Panhandle development is gradually working westward and to the southwest and much more development work would have been accomplished during 1917 were it not for a scarcity of material, labor, and water, the three essential things in the development of an oil field.

The extensive development that has been in progress during the entire year in North Texas has borne fruit to such an extent that the production of the defined fields is greater by some thousands of barrels than ever before in the history of the Panhandle oil development. The production has gradually grown until the monthly production reaches above a million barrels. The finding of a deeper pay sand late in 1916 has been a great boon to the field and numerous gushers have been developed in this lower formation, and it is owing to the deep drilling that the production has grown to such a proportion during the last twelve months. These deep sands are found in the Wichita field as well as in the Burkburnett fields, and the opening of the Culbertson field is a new one for the year and some very good finds have been made along with a number of failures, that are always expected in the testing out of new territory.

Wildcat Work.

Wildcat development has spread over a vast area of territory, although many of the wells were shut down at the close of the year, due to extreme cold weather, scarcity of water and labor, but will be started up and rushed to a finish as soon as weather conditions will permit. This wildcat work is centered in many counties, among which are: Archer, Wichita, Foard, Stephens, Eastland, Palo Pinto, Shackleford, Jack, Young, Tom Green, Montague, Grayson, Hood, Coleman, Brown, Anderson, Angelina, Atcosta, Bexar, Burleson, Brazos, Brooks, Bastrop, Brazoria, Colorado, Chambers, Duval, Freestone, Falfurrias, Fort Bend, Grimes, Galveston, Harris, Hardin, Jefferson, Jim Hogg, Jackson, Lavaca, Limestone, Lee, Liberty, McLennan, McMullen, Montgomery, Matagorda, Nagodoches, Orange, Pecos, Reeves, Starr, Shelby, San Augustine, San Jacinta, San Patricio, Travis, Tyler, Uvalde, Walker, Wilson, Waller, Zapata,

Bowie, Marion, Bass, Panola, and numerous other counties.

Brownwood Field.

Just at the close of the year a new excitement broke out in what is known as the Brownwood field, in Brown county, almost direct south of Wichita Falls and east from Coleman county. This new field has attained considerable proportions, with many wells already producing, with practically every foot of ground anywhere near the town of Brownwood under lease for oil and with two refineries under construction. There are approximately 200 wells yielding from 10 to 25 barrels each per day in the Brownwood field and many new rigs running. This field differs from other oil districts in the State in that no standard drilling rigs are seen; instead, drilling machines are used. The wells range from 200 to 300 feet in depth, as a rule, and gasoline machines are used for drilling, obviating the use and expense of derricks. It only requires a few days to finish a hole to the required depth.

Many of the wells are not cased, as casing is very difficult to secure now. In some instances common stove pipe is being used for casing. A move is on foot to do some deeper test work in the new field. Some of the wells flow their oil, but as a rule they are put on the pump and pumped. Men are worked day and night getting tanks in shape to hold the product from the wells, as it is impossible to secure enough tank cars to ship the product. The construction of two refineries is being rushed and the town is at fever heat with excitement, with practically everybody trafficking in leases or engaged directly in drilling for the product. The hotels are thronged and oil is about all that is being talked.

The larger number of the wells are located about a mile west of the town, near Round Mountain, but even in the heart of the town oil has been secured in drilling and wells are being drilled on many business and residence lots. The wells also show some gas.

The latest wells finished show some good production. The Martin & Ada Belle Oil Company's No. 1, on a town lot, pumped 30 barrels, and two other wells on town lots pumped 15 barrels each.

Whether or not the shallow Brownwood field will extend into Coleman, McCullough, San Saba, Mills, Comanche, Eastland or Callahan counties, all of which adjoin Brown county, is yet to be seen by test work that is being planned.

FINISHED WORK.

In the Panhandle-Texas fields during the year 1917 there was a total of 1,003 wells finished, the new production being 50,680 barrels, the greatest in the history of the field. There were sixteen gas wells with a combined open flow gas production of over 122,000,000 cubic feet and 268 dry holes. This is an increase over the 1916 work of 413 finished wells, 3,472 barrels production and 158 dry holes, while in gas wells there is a decrease of 19. The wells for the year were by months as follows:—

Month.	Comp.	Prod.	Gas.	Dry.
January	48	3,864	5	6
February	50	2,821	2	13
March	70	2,693	1	23
April	82	1,629	..	19
May	95	4,502	..	20
June	111	5,655	2	20
July	84	3,821	1	24
August	80	5,322	3	21
September	101	3,030	..	36
October	98	8,048	1	30
November	113	4,544	1	37
December	65	4,751	..	19
Totals	1,003	50,680	16	268
For 1916	590	47,208	35	110
Difference	413	3,472	19	158

WELLS BY COUNTIES.

The wells in the Panhandle fields were by counties each month as follows:—

Wichita Field.

Month.	Comp.	Prod.	Gas.	Dry.
January	10	3,110	..	1
February	21	2,170	..	1
March	19	2,150	..	5
April	19	760	..	5
May	25	2,740	..	2
June	27	4,310	..	5
July	10	765	..	2
August	13	703	..	2
September	15	250	..	7
October	15	2,980	1	4
November	24	1,090	..	7
December	15	1,165	..	4
Totals	214	22,193	1	45

Burkburnett Field.

Month.	Comp.	Prod.	Dry.
January	20	374	0
February	17	151	4
March	32	298	7
April	43	379	8
May	50	1,427	9
June	63	923	10
July	50	2,311	14
August	47	4,294	12
September	68	2,360	17
October	54	4,263	9
November	62	2,469	10
December	41	3,276	10
Totals	547	20,525	110

Petrolia Field.

Month.	Comp.	Prod.	Gas.	Dry.
February	4	105	..	3
March	1	50	..	..
May	1	..	..	1
July	2	325	..	..
August	2	..	2	..
September	2	300	..	..
October	3	35	..	2
November	1	..	..	1
December	4	235	..	2
Totals	20	1,050	2	9

Palo Pinto County.

Month.	Comp.	Prod.	Gas.	Dry.
January	11	185	4	2
February	11	370	2	3
March	10	70	1	5
April	14	365	..	1
May	10	310	..	..
June	15	162	2	4
July	10	95	1	2
August	7	145	1	1
September	10	50	..	5
December	1	..	..	1
Totals	99	1,752	11	24

Archer County.

Month.	Comp.	Prod.	Gas.	Dry.
January	4	175	..	2
March	7	125	..	6
April	4	125	..	3
May	7	25	..	6
July	1	..	..	1
August	4	15	..	3
September	3	5	..	2
October	4	..	..	4
November	10	100	..	9
December	1	25	..	..
Totals	45	595	..	36

Stephens County.

Month.	Comp.	Prod.	Gas.	Dry.
January	1	..	1	..
February	2	25	..	1
April	1	..	..	1
May	1	..	..	1
July	1	..	..	1
September	1	50	..	..
November	2	200	..	1
December	1	..	..	1
Totals	10	275	1	6

Culbertson Field.

Month.	Comp	Prod.	Dry.
June	6	260	1
July	10	325	4
August	5	65	2
September	12	65	10
October	8	120	4
November	12	685	8
December	1	50	..
Totals	54	1,570	29

Eastland County.

Month.	Comp.	Prod.	Gas.	Dry.
October	1	510	..	..
November	1	..	1	..
December	1	..	..	1
Totals	3	510	1	1

Parker County.

Month.	Comp.	Prod.	Dry.
January	1	..	1
May	1	..	1
August	1	100	..
Totals	3	100	2

Coleman County.

Month.	Comp.	Prod.	Dry.
October	2	90	1

Jack County.

Month.	Comp.	Prod.	Dry.
January	1	20	1
February	1	..	1
Totals	2	20	2

Other Counties.

One dry hole each was drilled in Jones, Young, Concho and Brown counties.

RECAPITULATION.

The wells for the year were distributed by fields as follows:—

Month.	Comp.	Prod.	Gas.	Dry.
Wichita-Electra	214	22,193	1	45
Burkburnett	547	22,525	..	110
Petrolia	20	1,050	2	9
Palo Pinto	99	1,752	11	24
Archer	45	595	..	36
Stephens	10	275	1	6
Culbertson	54	1,570	..	29
Eastland	3	510	1	1
Parker	3	100	..	2
Coleman	2	90	..	1
Jack	2	20	..	1
Jones	1	..	..	1
Young	1	..	..	1
Concho	1	..	..	1
Brown	1	..	..	..
Totals	1,003	50,680	16	268

ANNUAL WELLS.

The good wells for the year were by counties and fields each month as follows in the Panhandle fields:—

January.

ELECTRA.

Magnolia Petroleum Company, No. 4 Piper tract, 2,200 barrels, and No. 75 Allen tract, 100 barrels.

Producers' Oil Company, No. 16 Singer tract, 140 barrels; No. 50 Singer tract, 400 barrels; No. 59 Bickley tract, 150 barrels; No. 61 Bickley tract, 600 barrels, and No. 80 Waggoner tract, 150 barrels.

W. W. Silk's No. 5 Crow tract, 200 barrels.

PALO PINTO COUNTY.

Texas and Pacific Coal Company, No. 1 Cody tract, 7,000,000 cubic feet of gas, and No. 71 Stewart tract, 3,000,000 cubic feet of gas.

Owen & Palmer, No. 1 Nobles tract, 3,000,000 cubic feet of gas.

SAN PATRICIO COUNTY.

Southern Gas Company, No. 1 Corpus Christi tract, 10,000,000 cubic feet of gas.

February.

ELECTRA.

Magnolia Petroleum Company, No. 5 Piper tract, 4,000,000 cubic feet of gas.

STEPHENS COUNTY.

Texas and Pacific Coal Company, No. 1 Wright tract, 4,000,000 cubic feet of gas.

PALO PINTO COUNTY.

Sinclair Oil and Gas Company, Holt ranch, 5,000,000 cubic feet of gas.

March.

ELECTRA.

Producers' Oil Company, Nos. 49 and 50 Bywaters tract, 125 and 150 barrels.

Magnolia Petroleum Company, No. 14 Sumner tract, 300 barrels; No. 6 Piper tract, 1,200 barrels, and No. 23 Brown-Cross tract, 200 barrels.

ARCHER COUNTY.

Big Bludd Oil Company, Holliday tract, 5,000,000 cubic feet of gas.

Gulf Production Company, Hess ranch, 15,000,000 cubic feet of gas.

April.

ELECTRA.

Producers' Oil Company, Nos. 65 and 75 Stringer tract, 300 and 175 barrels.

ARCHER COUNTY.

Panther Oil Company, No. 4 Wilson tract, 125 barrels.

May.

ELECTRA.

Magnolia Petroleum Company, No. 20 Sumner tract, 1,500 barrels, and No. 7 Piper tract, 700 barrels.

Producers' Oil Company, No. 54 Bywaters tract, 100 barrels.

BURKBURNETT.

Brown & Jones, No. 4 Ramming tract, 100 barrels.

C. B. Farquharson, No. 1 Ramming tract, 500 barrels.

STEPHENS COUNTY.

Producers' Oil Company, No. 2 Parks tract, 7,000,000 cubic feet of gas.

June.

ELECTRA.

Magnolia Petroleum Company, No. 8 Piper tract, 1,500 barrels.

PALO PINTO COUNTY.

Empire Gas Company, Hess ranch, 5,000,000 cubic feet of gas, and No. 1 Chestnut ranch, 15,000,000 cubic feet of gas.

Texas and Pacific Coal Company, Nos. 171 and 174 fee tract, 1,000,000 cubic feet of gas each.

STEPHENS COUNTY.

Producers' Oil Company, Stephens tract, 200 barrels.

EASTLAND COUNTY.

Producers' Oil Company, Parks tract, 200 barrels.

YOUNG COUNTY.

Producers' Oil Company, Hunt tract, 5,000,000 cubic feet of gas.

July.

ELECTRA.

Producers' Oil Company, No. 50 Stringer tract, 300 barrels.

CULBERTSON.

Morrisey, Brown & Co., No. 1 Burnett tract, 150 barrels.

Sixty-Six Oil Company, No. 2 Burnett tract, 150 barrels.

BURKBURNETT.

Brown & Jones, Heiserman tract, 700 barrels.

Adams Oil Company, No. 1 Ramming tract, 500 barrels; No. 2 also 500 barrels.

W. G. Selley, No. 4 Ramming tract, 200 barrels.

PALO PINTO.

Sinclair Oil and Gas Company, No. 2 Holt ranch, 100 barrels.

Texas and Pacific Coal Company, No. 3 Robinson tract, 5,000,000 cubic feet of gas.

August.

ELECTRA.

Producers' Oil Company, No. 56 Bywaters tract, 500 barrels.

BURKBURNETT.

C. B. Farquharson, No. 2 Ramming tract, 450 barrels.

Producers' Oil Company, Friedline tract, 400 barrels.

Harvey Oil Company, No. 11 Ruyle tract, 200 barrels.

Humble Oil and Refining Company, No. 13 Serrien tract, 2,500 barrels.

Ruyle Farm Oil Company, No. 11 Ruyle tract, 400 barrels.

Panhandle Refining Company, No. 5 Ramming-Klein tract, 650 barrels.

Adams, Farbee & Co., Ramming tract, 250 barrels.

PALO PINTO.

Texas and Pacific Coal Company, No. 193 fee tract, 1,500,000 cubic feet of gas.

PETROLIA.

Lone Star Gas Company, No. 5 Skelley tract, 13,000,000 cubic feet of gas.

PARKER COUNTY.

Parker County Oil and Gas Company, No. 3 Mortens tract, 200 barrels.

STEPHENS COUNTY.

Gulf Production Company, No. 1 McCauley tract, 5,000,000 cubic feet of gas.

EASTLAND COUNTY.

Texas and Pacific Coal Company, Walker tract, 2,000,000 cubic feet of gas.

September.

ELECTRA.

Producers' Oil Company, No. 27 Waggoner tract, 115 barrels.

BURKBURNETT.

Magnolia Petroleum Company, No. 8 L. F. Ramming tract, 750 barrels; and No. 14 W. F. Ramming tract, 150 barrels.

Humble Oil and Refining Company, No. 10 Schultz tract, 700 barrels.

Adams Oil Company, No. 8 L. F. Ramming tract, 150 barrels.

Panhandle Refining Company, No. 5 Ramming tract, 100 barrels.

PETROLIA.

Finnick-Minnick Oil and Gas Company, No. 2 Taylor tract, 300 barrels.

Lone Star Gas Company, No. 6 Skelley tract, 20,000,000 cubic feet of gas.

PALO PINTO.

Texas and Pacific Coal Company, No. 210 fee tract, 1,000,000 cubic feet of gas.

STEPHENS COUNTY.

Texas and Pacific Coal Company, No. 2 Binney tract, 2,500,000 cubic feet of gas.

October.

ELECTRA.

Magnolia Petroleum Company, No. 22 Sumner tract, 1,000 barrels, and No. 10 Piper tract 700 barrels.

Producers' Oil Company, No. 78 Stringer tract, 6,000,000 cubic feet of gas; No. 7[illegible] Stringer tract, 100 barrels, and No. 143 Waggoner tract, 1,200 barrels.

BURKBURNETT.

Humble Oil and Refining Company, No. 1[illegible] Serrien tract, 1,000 barrels; No. 16, same tract 1,800 barrels.

C. B. Farquharson, No. 10 Ramming tract, 200 barrels; and No. 11, 330 barrels.

Panhandle Refining Company, No. 6 Ramming tract, 125 barrels.

Ruyle Farm Oil Company, No. 14 Ruyle tract, 490 barrels.

STEPHENS COUNTY.

Texas and Pacific Coal Company, McCloskey tract, 2,000,000 cubic feet of gas.

EASTLAND COUNTY.

Texas and pacific Coal Company, McCloskey tract, 500 barrels.

November.

ELECTRA.

Producers' Oil Company, No. 38 Bywaters tract, 550 barrels.

Magnolia Petroleum Company, No. 16 Allen tract, 125 barrels.

BURKBURNETT.

Ruyle Farm Oil Company, No. 15 Ruyle tract, 300 barrels.

Humble Oil and Refining Company, No. 1[illegible] Schultz tract, 700 barrels, and No. 17 Serrien tract, 1,500 barrels.

McBain Oil Company, No. 2 Prechel tract, 200 barrels.

Adams Oil Company, No. 5 Ramming tract, 150 barrels; No. 6, 100 barrels.

Panhandle Refining Company, No. 7 Ramming tract, 150 barrels.

Harvey Oil Company, No. 12 Ruyle tract, 150 barrels.

A. B. Farquharson, No. 12 Ramming tract, 150 barrels.

ARCHER COUNTY.

Panther Oil Company, No. 10 Wilson tract, 100 barrels.

STEPHENS COUNTY.

Texas and Pacific Coal Company, Lee tract, 250 barrels.

EASTLAND COUNTY.

Texas and Pacific Coal Company, No. 2 Walker tract, 8,000,000 cubic feet of gas.

CULBERTSON COUNTY.

6666 Oil Company, No. 2 Burnett tract, 400 barrels.

Gulf Production Company, Burnett tract, 200 barrels.

PETROLIA COUNTY.

Finnick-Minnick Oil and Gas Company, No. 6 Taylor tract, 200 barrels.

December.

ELECTRA.

Hindecopper & Wood, Ward-Todd tract, 100 barrels.

The Texas Company, No. 61 Bywaters tract, 400 barrels.

Magnolia Petroleum Company, No. 13 Piper tract, 400 barrels.

BURKBURNETT.

Perkins & Snyder, No. 2 Serrien tract, 2,400 barrels.

Humble Oil and Refining Company, No. 17 Serrien tract, 500 barrels.

Panhandle Production.

The following is the production of oil in the Texas-Panhandle fields each month during 1917:—

Month.	Production, barrels.
January	804,91[illegible]
February	731,03[illegible]
March	784,27[illegible]
April	795,86[illegible]
May	866,85[illegible]
June	876,94[illegible]
July	931,76[illegible]
August	1,003,91[illegible]
September	998,29[illegible]
October	1,047,90[illegible]
November	1,046,93[illegible]
December	1,038,80[illegible]
Total	10,930,50[illegible]
Car shipment during year rfom Corsicana, not included in above	70,20[illegible]
Casinghead gasoline shipped by car	100,00[illegible]
Total for year	11,100,70[illegible]

Production by Districts.

Distriot.	Production barrels.
Electra	5,999,99[illegible]
Burkburnett	3,625,03[illegible]
Petrolia	273,22[illegible]
Strawn	406,92[illegible]
Corsicana	389,88[illegible]
Wildcats	305,63[illegible]
Casinghead gasoline	100,00[illegible]
Total, 1917	11,100,70[illegible]
Total, 1916	8,852,86[illegible]
Increase	2,247,84[illegible]

Note.—The production of the Culbertson district is included with that of Electra.

NORTH LOUISIANA PRODUCTION CUT DOWN BY 3,068,415 BARRELS AS AGAINST 1916

Output Not More Than One-Half What It Was Two Years Ago—Important Developments During the Year.

The total production of crude petroleum, produced in the north Louisiana field during the year 1917 is estimated at 8,779,415 barrels, a decrease of 3,068,415 barrels from that of the previous year. The highest record this field has ever made was in 1915, when the total production amounted to a little more than 15,000,000 barrels. Since that time, the output has been steadily decreasing until it is not much more than half what it was two years ago.

The most important development of the year was the extension of the Caddo field to include the Pine Island district, which heretofore had produced only a few small pumpers, and is now the chief center of operations in the Caddo field. Several 1,000 and 2,000-barrel wells have been completed in this district, and early in December the climax was reached in this territory by the Texas Company, which brought in a 10,000-barrel gusher in No. 1 Hellperin.

This well was allowed to run wild for nearly two weeks, its gas pressure being estimated at 40,000,000 feet, with the result that many of the other wells in this district stopped flowing and had to be put on the pump. While this somewhat dampened the enthusiasm which had attended development in the new district, it failed to lessen the activity, and there are now upward of forty rigs running with continued extensions of the defined limits of the pool.

Pine Island.

The oil in the Pine Island district is heavy, averaging 26.5 degrees Baume, and the production in this territory has almost doubled the previous production figures for heavy oil in the Caddo field. The new pool has proved an El Dorado for independent operators, as comparatively little of the surrounding territory had been taken up by the large companies when oil was discovered here, and dozens of small companies were organized for development, with remarkably successful results.

For several years past repeated and tireless

efforts have been made to locate oil in paying quantities in Bossier parish, but up to the present time the results of these operations have been far from satisfactory. Early in June a well was brought in by the Dallas Oil Company in what became known as the Plain Dealing district, which had an initial production estimated at 1,200 barrels, and considerable excitement was occasioned by the find, with its attendant wild speculation in leases and temporary activity. Further development, however, resulted in nothing but salt water, and most of the wells started at that time have been abandoned. The fact was established, nevertheless, that there is a pool of oil somewhere in that vicinity, and there are always a few scattered tests in progress, trying out the territory. The Plain Dealing district lies at the north end of Bossier parish, ten miles east and five north of the Pine Island district, in Caddo.

Elm Grove.

In the south end of Bossier parish a small pool of heavy oil has been developed in the chalk rock, in what is known as the Elm Grove district, but this production is of comparatively little importance as compared with the enormous gas production in this territory. More than fifty gas wells have been completed in the Elm Grove district, most of them making from 30,000,000 to 40,000,000 cubic feet of gas per day, and the proven territory from which this gas is available is fully fifteen miles square.

An important gas territory has also been developed in the Monroe district, which includes several parishes in the northeast corner of Louisiana and covers a territory twenty miles square. The wells in this district are not so large as those in the Elm Grove district, but they are rich in carbon deposit, and a number of carbon plants have been built, with more under process of construction for the purpose of manufacturing carbon. This product is becoming more and more valuable, and is a necessity in the manufacture of steel or guns, printers' ink, carbon paper and paint, and its use in automobile tires has extended their life fully 20 per cent., but a serious protest is being made by Shreveport citizens against using the gas for this purpose, fearing exhaustion of their fuel supply.

Oil Workers' Strike.

A strike was declared by the Oil Field Workers' Union on the first of November, which lasted nearly through December, and which seriously interfered with the producing and of the oil business and reduced the amount of production during those two months. The producers refused to recognize the union or treat with them collectively or through their representatives, although every effort was made to adjust their differences in a personal manner, and as fast as possible the places of the strikers were filled with imported men and work continued without them. A mediator was appointed by the government, who directed the producers to comply with the demands of the strikers, and immediately upon announcement of his findings the strike was officially declared off by the labor leaders. This called forth a strong protest, and a meeting was called at which practically all the producing companies of North Louisiana and Texas were represented, and a request was made that they be allowed to take their case before the General Mediation Committee at Washington before any further steps were taken. The request was granted, and in the meantime there has been no official recognition of a settlement of the strike, and the oil fields are still under a heavy guard of regulars of the United States army.

Additions to Field.

A few unimportant extensions of the Caddo field were made during the year, chiefly east and south of Mooringsport, but as a rule drilling operations have been conducted on old leases in proven territory, and have resulted in small pumpers but comparatively few dry holes. Following is a summary of wells completed in the North Louisiana field during the past year, with initial production:—

Districts.	Comp.	Prod.	Dry.	Gas.
Caddo	276	49,550	26	10
De Soto	44	7,050	11	4
Red River	40	2,420	10	3
Bossier	28	1,440	5	18
Miscellaneous	80	45	54	12
1917	467	60,505	106	47
1916	550	55,930	150	60
Difference	73	4,575	44	13

A decrease of seventy-three in the number of completed wells and an increase of 4,575 barrels in initial production makes a little better average per well than that of the previous year, but the results of the year's work are far from satisfactory, and it is hoped that the coming year will show an improvement.

Production by Months.

Following is a table showing the production of the North Louisiana field, including Northeastern Texas, for 1917, by months:—

North Louisiana Production During 12 Months.

	Caddo, light.	Caddo, heavy.	De Soto and Red River.	Total.
January	336,910	57,050	275,660	669,620
February	380,800	59,990	259,105	699,895
March	338,170	63,000	261,030	662,200
April	461,580	82,145	323,121	866,846
May	382,935	73,955	263,620	730,510
June	465,850	97,720	369,245	932,785
July	434,455	82,250	241,269	757,974
August	431,410	115,115	228,235	774,760
September	516,495	165,095	269,360	950,950
October	381,760	149,520	197,505	728,805
November	144,585	179,200	78,225	402,010
December	274,225	173,810	165,025	613,060
Totals, 1917				8,779,415
1916				11,848,301
Decrease				3,068,886

Average Prices Paid.

The average price paid for crude oil during the past year was $1.87 for Caddo light and 96 cents for Caddo heavy; $1.77 for De Soto and $1.40 for Crichton, the following table giving the credit balance quotations of the year:—

	Caddo					
1917.	38 and above.	35 to 37.9.	32 to 34.9.	heavy.	De Soto.	Crichton.
January 3	$1.50	$1.40	$1.35	$0.85	$1.40	$1.10
January 6	1.50	1.40	1.35	.85	1.40	1.20
January 8	1.60	1.50	1.45	.95	1.50	1.20
January 23	1.70	1.60	1.55	.95	1.60	1.30
February 15	1.70	1.60	1.55	.95	1.60	1.40
March 9	1 80	1.70	1.65	.95	1.70	1.40
March 14	1 80	1.70	1.65	1.00	1.70	1.40
March 17	1.90	1.80	1.75	1.00	1.80	1.40
August 22	2.00	1.90	1.85	1.00	1.90	1.50

GULF COAST CRUDE OIL PRODUCTION GAINED 3,000,000 BARRELS OVER 1916

South Texas Output Was 22,083,420 Barrels; South Louisiana, 2,966,875—This Was a Loss for Louisiana —Gains Made Despite Strike Troubles.

The past year has been the most prosperous the Gulf Coast region has known since oil was first discovered within its boundaries. Not only was there an increase in crude petroleum of more than 3,000,000 barrels over the amount produced for the year 1916, but prices have been higher and facilities for handling the oil better, while the entrance of several important Eastern interests and the building of large refineries evidence continued prosperity.

While the entrance of the United States into the world war, a serious lack of material for drilling operations and the corresponding high cost of the same, together with the strike situation, have been handicaps not easily surmounted, the general outlook for the year is most encouraging.

Production 25,050,295 Barrels.

The total production of crude petroleum in the Gulf Coast division for the year 1917 was 25,050,295 barrels, an increase of 3,202,180 above the amounts produced by this division in 1916, which had a total production of 21,848,115 barrels. The total amount produced in 1917, the greater portion of it came from the South Texas fields which produced 22,083,420 barrels. South Louisiana produced 2,966,875 barrels. In 1916 South Texas produced 18,027,010 barrels and South Louisiana 3,821,230 barrels. These figures show an increase in production in the South Texas districts of 4,056,410 barrels and a decrease of 854,230 barrels in the South Louisiana districts.

The increase for the past year in the South Texas fields was principally due to the showing the Goose Creek field made, producing 7,623,270 barrels for the year. The field did not enter the gusher class until August, 1916, and its total output for that year was 558,835 barrels. This gives an increase of 7,064,435 barrels for the year 1917. Only one other field in the entire coastal division showed an increase in production during the past year. This was Spindletop, which at the beginning of 1917 had no rigs running. The field has been gradually picking up during the year and shows an increase in production of 24,090 barrels, producing a total of 375,505 barrels for the year under review.

Two New Fields.

Another cause contributing to the gain in production was the entry of two new fields, one in South Texas and the other in South Louisiana. These were Damon Mound and New Iberia, both bringing in a gusher in May. Neither of the fields came up to expectations, although Damon Mound at the close of the year showed considerable activity, with thirty rigs and several new derricks. Its total output at the close of the year was 494,710 barrels. New Iberia has proved a disappointment; besides its original gusher, which had an initial production of 1,000 barrels, only one other producing well was brought in during the year. It was a pumper of 250 barrels. Total output of this field at close of the year was 22,415 barrels.

In the South Texas fields, the decline in the Humble field for the year was 3,207,110 barrels, it having produced 7,115,160 barrels in 1916, against 10,322,270 in 1915. Decreases in the other fields were as follows:—Batson, 53,880 barrels; Markham, 25,025 barrels; Saratoga, 33,395, and Sour Lake, 94,255 barrels. All fields in South Louisiana showed a decline. Edgerly, 525,870 barrels; Vinton, 218,055 barrels; Jennings, 99,635 barrels, Anse la Butte, 22,495 barrels, and Welsch, 10,570 barrels.

Over half the total amount produced in the South Texas fields came from Goose Creek and Humble, the total output of these two districts being 14,738,430 barrels.

U. S. Figures 5 Per Cent. Low.

The figures given do not represent the actual pipeline runs nor the quantity of crude petroleum marketed, but include the total production on each district based upon monthly reports, which include pipeline runs, oil used for fuel in drilling and operating leases, and sold by independent operators to small consumers, such as rice farmers and mill operators with plants adjacent to the various fields. These estimates will be found to run about 5 per cent. higher for each district than the figures published by the United States Geological Survey.

At the beginning of the year drilling operations were active in general throughout the coastal region, with Goose Creek first in rank. Drilling was active in the Humble district, while the advent of an unusually large gusher in the Sour Lake district, which broke all connections and ran wild, caused a diversion in the excitement at Goose Creek. Important properties in the Goose Creek and Sour Lake districts changed hands, with prices paid for same running into the millions in some instances.

In May the attention of operators was again diverted by the entrance of Damon Mound as a gusher field, when the Texas Exploration Company, after prospecting there for a period of over two years, and an outlay of about $400,000, succeeded in bringing in a 5,000-barrel gusher. Again there was a wild scramble for leases, but not anything like it was in the early days of Goose Creek, as the company bringing in the well had leases on about everything in sight, having from 5,000 to 6,000 acres blocked up almost solidly. Consequently there was comparatively little trading in leases.

During the same month the Gulf Refining Company brought in a flowing well of 1,000 barrels in New Iberia, South Louisiana. By this time drilling operations in the Sour Lake district were slowing up; records show that with one exception no wells of large production were completed in this district later than May during the entire year. Deep testing failed to bring anything like a paying proposition in any of the wells completed.

In August the Yount-Lee Oil completed a deep test southeast of production that flowed 1,500 barrels oil, 31 degrees Baume scale, at the depth of 4,200 feet. It settled down to 600 barrels a day and flowed for some time. This was the last well of 1,000 or more completed there during the remaining months of the year. Deep drilling failed to duplicate this well, and at the close of the year about six rigs were running in the field. The daily production of the field held up remarkably well.

Scarcity of Material.

The diverting of material for war munitions had already caused a scarcity of pipe for drilling purposes before the United States entered the war. After war was declared the situation became more acute, and shortage of cars to handle material added to the troubles of the operators while prices advanced. These conditions prevailed throughout the year, with an easing up in the pipe situation near the close of the year. Drilling continued active in practically all districts during the summer.

Strike Effects.

With the fall came mutterings of discontent among the oil field workers in the coastal fields, caused principally by newcomers. When the call for volunteers came, large numbers of the best class of workers joined the colors, leaving a shortage of men experienced in coastal drilling. The deficiency was made up from what material the operators could get. This was especially so at Goose Creek, where an unusually large number of men enlisted and many more were drafted. During the strike it was Goose Creek that was most seriously affected, although most of the old men of the different companies remained loyal. The strike called November 1 effectively tied up drilling operations in all fields except Humble and Damon Mound, where a number of rigs did not shut down. Production was not affected to an appreciable extent, the operators putting all available men to pumping or running the producing wells. Men were gradually found to replace the striking workers, and some of them returned to work. The sending of mediators by the government to Houston in an effort to settle the differences between worker and operator failed, resulting in finally carrying the matter to Washington, where, at the close of the year, representatives of both operators and workers were in conference with government officials.

Uncertainty as to the government's attitude caused no new contracts for crude oil at the wells to be made at the close of the year, and no move was expected to be taken until definite word from Washington was received as to the fixing of prices for fuel oil for the navy. Much of the fuel oil of the Gulf coast is supplied by Texas refiners to the navy, and the prices paid by the government will naturally influence prices offered producers, who expect to receive a substantial advance over contract prices of 1917, which ran from $1.10 to $1.40 at the wells, on account of the increased cost of operations.

Prices Almost Stationary.

Credit balance quotations in the Gulf coast region remained almost stationary throughout the year, $1 being quoted for all districts except Spindletop, which was $1.05, and Edgerly, at 95c. per barrel. On April 4 Goose Creek crude was quoted at 90c., on account of flush production, but advanced to $1 per barrel again on August 31. Credit balance quotations have very little to do with the price of oil in coastal fields, as most of it is contracted for from one to three years at from 15c. to 25c. per barrel higher than these quotations.

Several new interests entered the Gulf coast teritory during the year, the most important being the Sinclair interests, which purchased the stock control of the various Simms oil properties in Mexico and Texas. The amount of money involved in the transaction was in the neighborhood of $25,000,000. The Texas properties include valuable holdings at Goose Creek, Sour Lake and Damon Mound. A large tract of land was purchased by the Sinclair interests on the Houston ship channel, and a large refinery will be built there. Another important transaction during the year was the purchase of a controlling interest in the Gulf Coast Oil Corporation's holdings by the Atlantic Refining Company, involving $1,000,000 of money.

New Refineries.

Plans were under way at the close of the year for several new refineries, the most important interests being the Sinclair and the Empire Gas and Fuel Company. A refinery with a daily capacity of 1,200 barrels was completed and running by the close of the year, built and owned by the Hoffman Oil and Refining Company, and situated at Fort Houston, on the ship channel. Nothing had been done toward the actual building of the Sinclair interests refinery on the ship channel, except securing the right-of-way for its 8-inch pipeline from Healdton to Houston. The Pierce-Fordyce Association has completed an 8-inch line from Healdton to Fort Worth, a distance of 106 miles, and is considering the advisability of extending it on to its refinery at Texas City. The Magnolia Petroleum Company completed its second loop, or 8-inch line extending from Oklahoma to Beaumont, to its refinery there. At Goose Creek the Gulf pipeline doubled its 6-inch loop from the field to its mixing plant at Lynchburg, on the ship channel, a distance of seven miles, and the Sun Pipeline Company laid a 6-inch line from Goose Creek to Baytown, on the ship channel. The oil is being barged from the loading wharves on the channel. In September the Rio Bravo Oil Company (producing subsidiary of the Southern Pacific Railroad) completed a 6-inch line running from Damon Mound to Fledger, a station on the Southern Pacific Railroad, crossing the San Bernard river and going through two miles of almost impassable jungle. The distance of 11 miles was completed in 29 days. The Southern Pacific uses the oil piped from Damon Mound, mixed with Mexican crude, as fuel for its engines. The Galveston, Harrisburg and San Antonio Railroad, part of the Southern Pacific system, made an extension of its line from Rosenburg to Damon Mound, which was practically completed at the close of the year, as was also the railroad built by R. S. Sterling from Dayton to the Goose Creek field. The road was built by way of Barbers Hill, the total length of the road being 23 miles.

New Pipeline Law.

On June 20 the new Texas pipeline law went into effect, placing the pipelines within the State under the jurisdiction of the State Railroad Commission, and requiring the separation of pipelines from other branches of the oil industry and making them common carriers within the State.

In November the liquidation of the Producers' Oil Company was effected. All of its properties and assets were transferred to the Texas Company, which already controlled all but two shares, which were controlled by J. S. Cullinan, through the Fidelity Trust Company of Houston. The Producers' Oil Company had an authorized capital of $3,000,000 and had production in Texas, Louisiana, Oklahoma, Mexico and Wyoming and held leases in several other States.

Following a decision rendered by the court that the corporation was not connected with any trust and monopoly and was independently owned and operated, the Pierce Oil Corporation was granted a permit in December to do business in Texas, the belief being general that the Pierce Oil Corporation would proceed with its original plans and acquire the properties of the Pierce-Fordyce Association.

New Corporations.

During the year many new oil corporations were formed and chartered for drilling in coastal territory, and a number of Eastern companies with capital up in the millions secured permits to operate in this region. One of the important new companies was formed in September, merging the holdings of the Huffstutler Oil Company and some of the properties of J. C. Stribling of Llano into the Crown Oil and Refining Company. The new company has an authorized capital of $2,000,000 and has a number of producing properties in Goose Creek, Humble, Batson and Damon Mound and in Oklahoma; also considerable wildcat acreage in different localities with several promising tests under way.

In March the Humble Oil Company changed its name to the Humble Oil and Refining Company and merged the interests of R. S. Sterling, W. W. Fondren, H. C. Weiss, R. L. Blaffer and W. H. Farish into the company, and increased its capital to $4,000,000.

Goose Creek.

Throughout the year Goose Creek continued to be the most active of the Gulf coast pools, maintaining its lead in amount of new work, and by May had advanced in position, leading both Humble and Sour Lake in the matter of daily production. Goose Creek had 454 completions for the year, of which 284 were producers and 170 failures. A considerable number of the producing wells were in the gusher class, the field having a total of 319,396 barrels initial production. The initial daily production, i. e., the first 24-hour period, must not be taken for the actual gauge of the well, which generally decreases its flow after the first day or two to a considerable extent. Wells in Goose Creek territory are generally short-lived, but many are of several thousand barrels daily capacity while flowing. The greatest amount of its new production for any one month of the year was March, which had a total of 43,800 barrels. June had 42,025 barrels. The average amount for a month was between 25,000 and 30,000 barrels. After the strike took effect the amount was materially reduced, but in November during the first days of the strike, when it was most effective, the field had 7,385 barrels initial production and 11,550 barrels for December.

Drilling Data.

At the beginning of the year Goose Creek had a total of about 100 tests drilling or getting ready to do so. In August it had 170. At the close of the year there were probably 30 rigs drilling, twice the number shut down and 30 derricks up at new locations. At the beginning of the year most of the wells were completed at a depth ranging from the 2,200-foot level to 2,600 feet. Late in January the Producers' Oil Company completed a well on its Isenhour lease a half mile west of production, at a depth around 2,800 feet. It was a 2,000-barrel well, but went mostly to water. The test completed in March by the West Virginia Oil Company on the Dolan land, also west of Goose Creek, was more fortunate, flowing 6,000 barrels of oil at the depth of 2,840 feet. This well was one of the best to be completed in Goose Creek during the year, flowing at the rate of 5,000 barrels daily for months. This well produced 300,000 barrels of oil in sixty days. On May 10 the West Virginia Oil Company paid a dividend to its stockholders of 400 per cent. The company was capitalized at $25,000. Other good completions were along the bay shore, and active prospecting of the submerged lands in the bay soon became general. Deeper drilling was also general, and at the close of July a dozen tests were drilling below 3,000 feet. Near the close of this month the Gulf Production Company brought in a gusher out in Tabbs Bay flowing at the rate of 12,000 barrels oil at around 3,000 feet, this being its third gusher to be completed in the bay. Many other good wells were completed on submerged lands during the remaining months of the year, the pay being generally found around 3,000 feet. Deeper drilling was resorted to in the older part of the field. The Simms-Sinclair interests deepened No. 11 Sweet, one of the first shallow wells to be drilled in Goose Creek, at a depth of about 3,000 feet; it ran wild at the rate of 30,000 barrels a day for three days and then sanded up. At the close of the year deeper drilling was general in the Goose Creek district, most of the good wells coming from the 2,800-foot and 3,000-foot sand. Some good ones in the bay were below 3,200 feet, the formation either being further from the surface there or else another sand. There are six sands at Goose Creek, the shallowest at 2,000 feet, one at 2,200 feet, another at 2,600 feet, one at 2,800, 3,000 and 3,200 feet.

Deep Tests Disappointments.

During the year deeper drilling became general in a number of the various fields, the theory being that rich pay was to be found at depth than any yet found. Most of them had been abandoned, or were about to be, at the close of the year. With the exception of the deep well completed in August at Sour Lake at 4,200 feet, all deep tests were disappointments when drilled below about 3,000 feet. Three other tests in the Sour Lake district showed rich oil sands and were drilled below 4,000 feet, but salt water ruined them. Similar conditions were found to exist in the deep tests at Batson,

Edgerly, Jennings, Vinton, Saratoga and Humble.

Humble Declines.

The Humble field fell off over 3,000,000 barrels in amount of production during the year, but even then produced nearly as much as the Goose Creek field. Wells completed in the Humble district hold up much better than in the Goose Creek field. Humble continued to produce some good wells all through the year, but the total amount of new production fell 219,275 barrels short of the figures of 1916. For the year under review this district had 300 completions, 216 of them were oil producing and 144 were failures. The initial production totaled 56,605 barrels for 1917, against 275,920 barrels for 1916. The greatest amount of new production for any one month of the year was in August, which had 7,325 barrels. February had 7,117, January-September almost as much, while in November, the month the strike was most effective, the field had 6,100 barrels new production. Most of the rigs ran in the Humble field regardless of the strike, as most of the men employed remained loyal to their employers.

Good wells were completed on the Hermann 500-acre lease during the year by the Invincible Oil Company. Many wells were drilled in the shallow districts, especially around the Humble Iron Works, on both sides of the road. Crown Oil Company drilled about 30 wells; the Ohio Valley Oil Company had a number on the Echols, as well as other companies, north of the San Jacinto River; the Onalaska Oil Company got some good wells on the House tract. West Production Company also drilled several tests on the House tract, Producers' Oil Company on the Foster and the Gulf Production Company on the Margay Oil Company's lease, all north of the San Jacinto River. Drilling also was active south of the Stevenson lease.

Sour Lake.

In January a gusher flowing 10,000 barrels initial production was completed at Sour Lake by the Humble-Gulf companies. This was No. 15 on the Hardin County Oil Company's lease, near No. 14, belonging to the same interests, completed the month before and at that time producing 5,000 barrels oil daily. The new gusher cut out all connections, spouting oil fifty feet above the derrick for two days, and then sanded up. This was the last big gusher to be completed in the Sour Lake field. During the early months of the year and as late as May good flowing wells of from 2,000 to 3,000 barrels were completed in this district, but from May on to the close of the year the field declined as far as results in drilling operations were concerned, although the daily production kept up for several months more, but at the close of the year daily production was a little better than 8,000 barrels. Early in the year it had ranged between 18,000 and 20,000 barrels. Drilling operations were effectively shut down when the strike went into effect, and but five or six rigs had resumed drilling at the close of December. Good pumpers were completed at intervals throughout the year, the total initial production being over 1,000 barrels during June, July and August. March had 12,295 barrels and January 11,610 barrels. In September there were but 475 barrels new production, 965 in October and 200 barrels in November after the strike was called, when one 200-barrel well was completed. There were no completions in December. The total new production of the Sour Lake district for the year was 43,975 barrels, against 61,495 barrels in 1916, a decrease of 17,520 barrels for the year under review. There was a total of 182 wells completed in 1917, of which 131 were producers. The total number of wells completed in 1916 was 135.

Some of the deepest tests ever drilled in coastal pools were completed in the Sour Lake pool during the year. The Yount-Lee Oil Company completed No. 4 Lynn in February at a depth of about 3,600 feet and got a flow of high-grade oil testing 37 degrees Baume scale. It came in flowing about 1,000 barrels, but soon settled down to 400 barrels. In May the same company brought in a well, No. 4 Crosbie, at 3,815 feet, flowing 3,000 barrels, but it soon sanded up. Early in September the same company completed No. 6 Crosbie at a depth of 4,200 feet, flowing 1,500 barrels of 31-degree oil. It held up for some time at the rate of 500 barrels per day. Other deep tests were drilled by the Producers' Oil Company (Texas Company), but were not successful, No. 1 being abandoned at 4,400 feet.

New Damon Mound Field.

The most interesting event of the year was the finding of a new field at Damon Mound, in Brazoria county. The Texas Exploration Company had been prospecting here for two years. The well known as No. 3 Bryan came in flowing 5,000 barrels of oil at a depth of 1,440 feet on May 9. It first came in a gasser in February, but went to oil about the middle of April, flowing at the rate of 400 barrels a day for some time and then sanding up. When the well was opened up it shot oil far above the derrick, but as it had extra heavy connections it was soon controlled. The well was located in the village, a few feet southeast of what was the general store and postoffice. Damon Mound, being isolated as far as transportation was concerned, had no way to dispose of the oil, which flowed steadily at the rate of about 4,000 barrels a day for months. The Texas Exploration Company constructed storage tanks of 30,000, 40,000 and 80,000 barrels capacity, and a 100,000-barrel earthen reservoir. Later additional tanks were built of 100,000, 250,000 and 300,000 barrels. Total storage said to have a capacity of 1,325,000 barrels. Drilling at once became active at the Mound, with all the earmars of an oil boom. Other important interests entered the field, and at the close of the year about thirty tests were drilling. While a number of good pumpers were completed in this field, but one other gusher was completed, this by the same company in August, which flowed at about the same rate as the discovery well. This original well was still flowing at about 1,000 barrels at the close of the year. It choked up several times, but came back still flowing when cleaned out. Until the Rio Bravo completed its pipeline in the early fall there was no means of disposing of the oil, which was kept in storage. The Rio Bravo was running about 2,500 barrels daily through its line at the close of the year. As a field the Damon Mound is a puzzle and something of a disappointment. There seems to be no rule by which to govern drilling operations. In some instances the pay is found around 1,400 feet, near the depth of the original gusher; in others it is found much deeper, within a few feet of the shallower well. At the close of the year several tests of the Texas Exploration Company, which has the majority of tests drilling, were below 3,000 feet. The daily production at the close of the year was 2,000 barrels. From the time of the completion of the original gusher until the close of the year 32 wells had been completed. Of these twelve were oil, two of them 5,000-barrel gushers, and the remainder wells from 100 to 500 barrels initial production. Total new production of the field for the year 1917 was 14,950 barrels.

At New Iberia.

About the time the Damon Mound field came into the limelight, a flowing well was completed at New Iberia, South Louisiana, making 1,000 barrels at 2,863 feet. The well belonged to the Gulf Refining Company and H. T. Stath. Several tests were put down in this vicinity, but with the exception of a 150-barrel well in September, this was the only producer. At the close of the year it was making about 30 barrels. Seven tests were abandoned and three were drilling at the close of the year in the New Iberia district.

Of the old fields, Spindletop held up the best, having a gain of 24,000 barrels in production for 1917. At the beginning of the year drilling was at a standstill, with no rigs running. Later in January two small wells were completed with a total of 50 barrels new production. While no wells of spectacular proportions were completed during the year, there were good pumpers of 100 and 200 barrels, and at the close of the year seven rigs were running, December having 315 barrels new production. Total new production for 1917 was 1,595 barrels, or 673 barrels more than the year 1916.

Markham.

At the beginning of the year the Markham field looked promising, with a circle of deep holes being drilled around the proven field. Results in deep drilling in this field were especially disappointing, but 795 barrels new production was uncovered throughout the year, the largest well being of 200 barrels. The Producers' Oil Company abandoned a test at the advanced depth of 4,770 feet. Other tests were abandoned at 3,400, 3,700 feet and deeper. At the close of the year there were five tests drilling, three by the Texas Company (Producers') at 3,200, 3,400 and 3,700 feet.

Saratoga and Batson.

Deep drilling at Saratoga and Batson did not bring substantial results. At the close of the year two deep tests were being put down at Saratoga, one by the Empire Gas and Fuel Company and the other by the Rio Bravo Oil Company. There were 51 wells completed in the Batson district, 42 of which were oil. Total new production for the year 2,395 barrels, or 8,859 barrels less than the amount produced in 1916. Saratoga had 48 completions, 35 of them oil, with a total new production of 2,590 barrels, or 540 barrels less than that produced in 1916. When the strike took effect Spindletop, Batson and Saratoga were worst effected.

South Louisiana.

The South Louisiana fields were not materially affected by the strike, all fields showing a decline in production for the year. Edgerly made the best showing, with 43 completions for the year, 33 of them oil, with 21,950 barrels new production, but this was 18,595 barrels less than in 1916. Several good-sized gushers were completed in this field by the Gulf Refining Company on the Bright-Penn; best well in January, No. 18, flowing from 5,000 to 8,000 barrels, and in May No. 21 on the same lease flowing 5,000 barrels.

Gushers from 3,000 to 8,000 barrels were discovered in the Vinton field, the largest, with 8,000 barrels initial production completed in May by the Gulf Coast Oil Company. The total amount of new production showed a decline of 55,665 barrels for the year 1917, as compared with the record of 1916.

Jennings.

Deep drilling was resorted to in the Jennings field, but without results. Southwest of the field was the Evangeline Petroleum Company, east of production, W. Scott Haywood and two miles north George B. Zigler, all deep tests. Total new production for 1917 was 1,860 barrels, a decline of 3,025 barrels from the figures of 1916.

Wildcat Work Was at High Point of Activity.

As a result of one of the most active wildcat campaigns in the history of the oil industry in South Texas and South Louisiana in 1917, a new field was discovered at Damon Mound and several showings of oil in other localities. At New Iberia, where wildcat work had been under way for some time, a flowing well was brought in in May, and for a time it was thought it would prove to be the next new field, but no other important completions occurred during the year, and at its close New Iberia was not regarded by the fraternity in general as likely to be a paying proposition. Wildcat drilling was most active in Harris, Brazoria, Liberty, Hardin, Montgomery and Matagorda counties in South Texas, although several others had some likely prospects. In South Louisiana, Calcasieu, Jeff Davis, Iberia and Terrobone parishes were the most favored. During the closing months of the year new work shifted more to Southwest Texas, with activity in the Corpus Christi district, Piedras Pintas and in several counties bordering on the Rio Grande.

Liberty County.

Early in the year Liberty county seemed to be the most promising locality, the Empire Gas and Fuel Company of Texas had what promised to be a well on the Riveria tract in the Minchey survey, three miles south of Liberty. Storage tanks were built to care for the oil that did not materialize above the surface. Throughout the year this company and several others were active in this county, but without substantial results. At the close of the year the Empire was drilling three tests and was rigged for another. Fred S. Rowe, the Continental Oil Company and C. B. Shellebarger all had tests under way, while the Davis Hill the Humble-Gulf were drilling two tests. In December Shellebarger abandoned his test at 3,150 feet. In October the report was general that the Republic Production Company, drilling on an 800-acre tract of the Houston Oil Company, had an oil well under cover at Big Hill, Liberty county, near Hull, and considerable trading in leases followed until the middle of December, prices paid for acreage ranging from a few dollars to $500 per acre for close-in stuff. This was the second test of the Republic Company, the first having been abandoned in salt at 1,400 feet. In the middle of December the company abandoned the second test at 2,700 feet, also in salt, and had not decided at the close of the year whether to start another or not. The test was fenced in and a mystery made of it.

Besides the drilling resulting from the bringing in of the Damon Mound field, several other localities in Brazoria county were actively exploited. At Rattlesnake Mound Wallace, Gibbon & Zahniser were drilling all year, abandoning their first two tests at advanced depths and starting a third, having had favorable formations and showings of oil at several depths. At West Columbia the Texas Company kept one rig drilling throughout the year and one at Hoskins Mound. At West Columbia the Tyndall-Wyoming Oil Company got a small pumper on its first test on the Hogg tract, and at the close of the year had its second well near completion, it coming in a 200-barrel well in January, 1918.

Hardin County.

Wildcat drilling was active in Hardin county most of the year, but at its close most of the tests under way were shut down on account of the strike. In October the test of the Thousand Acre Oil Company in Big Thicket, in the Pine Island district, was attracting considerable attention with the report that the company had a well. A barb wire fence was put around it and scouts not allowed to enter. At the close of the year the test was still being closely watched. Nothing of value resulted in Harris county prospecting, although that county has nearly half the wildcat tests in the Gulf coast division. A showing of oil was found at Hockley, west of La Porte, at Seabrook and several other localities.

Results in drilling in the Piedras Pintas district were not encouraging. At the close of the year the Empire Gas and Fuel Company was drilling a deep test, having had no results in the ones drilled previously. The production of the district had dropped to about sixty barrels, but considerable leasing was being done by outside parties several miles north.

At the close of the year the Gulf Production Company had suspended operations at White Point, in the Corpus Christi district, and will probably abandon the territory. Its last test, No. 5 White Point, was abandoned at 4,000 feet. In November, 1914, the White Point Gas and Development Company brought in a big gas well at White Point. The gas caught fire and burned for some time, causing considerable excitement. The Gulf Company took over this company's holdings and put down five tests in all.

South Louisiana.

Drilling in South Louisiana resulted in the New Iberia field, but at the close of the year but three tests were drilling. In Terrebonne parish big gas wells have been found, and drilling was active there at the close of the year. A number of companies are drilling for sulphur in several different parishes, most being done in Calcasieu parish. Some new tests were being started near New Orleans in December.

Gulf Coast Production by Months.

The following tables give the production of each field in the Gulf coast division for the year 1917 by months and for the entire year, together with the combined total output of all fields in the division for each month and for the entire year:—

South Texas.

1917.	Batson.	Damon Mound.	Dayton.
January	70,390	.....	4,325
February	60,545	.....	3,180
March	59,130	.....	2,015
April	58,715	.....	1,640
May	57,365	.....	1,875
June	56,830	68,000	2,715
July	55,735	105,500	4,685
August	62,950	80,620	2,350
September	61,325	53,845	2,165
October	56,930	64,565	1,954
November	47,250	60,750	1,200
December	46,250	61,430	1,075
Totals	693,415	494,710	29,170
Totals, 1916	759,295	.....	.....

1917.	Goose Creek.	Humble.	Markham.
January	310,790	651,465	11,520
February	434,860	702,730	13,855
March	806,460	595,640	9,710
April	680,465	616,925	8,215
May	568,460	605,798	10,710
June	580,645	595,380	14,915
July	731,925	593,265	17,785
August	880,525	531,480	15,500
September	640,510	542,385	11,625
October	745,390	578,350	10,275
November	731,400	562,500	12,450
December	611,840	539,250	11,760
Totals	7,623,270	7,115,160	148,320
Totals, 1916	558,835	10,322,270	173,355

1917.	Piedras Pintas.	Saratoga.	Sour Lake.
January	1,010	59,580	665,880
February	4,845	60,636	690,160
March	3,975	58,715	388,435
April	3,545	62,130	391,760
May	4,815	60,240	388,635
June	3,560	66,450	380,720
July	3,905	63,670	382,415
August	2,830	68,320	366,845
September	3,105	69,520	310,375
October	2,915	66,125	305,480
November	2,850	38,400	257,250
December	2,775	28,620	266,575
Totals	40,130	702,405	4,794,530
Totals, 1916	.....	735,800	4,888,885

1917.	Spindletop.	All others.	Total.
January	29,040	3,825	1,812,670
February	27,285	5,275	2,002,500
March	25,980	5,165	1,954,795
April	26,915	5,655	1,857,275
May	29,290	5,945	1,781,266
June	27,320	5,585	1,802,475
July	25,830	7,560	1,991,000
August	31,270	5,840	2,048,805
September	32,765	7,060	1,734,490
October	31,830	5,495	1,869,235
November	40,800	4,500	1,759,275
December	47,380	5,500	1,519,680
Totals	375,505	66,805	22,083,420
Totals, 1916	351,415	237,155	18,027,010

	24,090	170,350	4,056,410

South Louisiana.

1917.	Anse la Butte.	Edgerly.	Jennings.
January	1,925	126,340	46,640
February	1,120	120,615	42,385
March	1,260	91,425	38,665
April	2,875	80,320	34,695
May	2,130	71,785	33,225
June	210	84,325	34,270
July	375	79,440	31,490
August	1,165	61,795	38,765
September	660	58,270	41,355
October	795	58,145	38,660
November	630	64,350	37,050
December	515	53,650	38,270
Totals	13,660	950,460	455,470
Totals, 1916	36,155	1,476,330	555,125

1917.	New Iberia.	Vinton.	Welsch.	Total.
January	....	124,615	365	299,885
February	....	126,970	710	291,800
March	....	98,395	765	230,510
April	....	143,740	740	262,360
May	....	194,525	600	302,265
June	....	128,840	1,725	249,370
July	6,370	117,955	1,115	236,745
August	4,810	135,160	1,385	243,080
September	9,820	102,895	930	206,950
October	3,365	120,810	630	222,405
November	2,600	117,450	....	222,080
December	2,450	104,560	....	199,445
Totals	22,415	1,515,905	8,965	2,966,875
Totals, 1916	....	1,733,960	19,535	3,821,105

	....	218,055	10,570	854,230

Totals for Gulf Coast Division.

South Texas	22,083,420
South Louisiana	2,966,875
Totals	25,050,295
Total, 1916	21,848,115
Total increase, 1917	3,202,180

Credit Balance Quotations for 1917.

In the Gulf coast division credit balance quotations have very little to do with prices of oil, as most of it is contracted for from one to three-year periods at 15 to 25 cents per barrel higher.

Credit balance quotations changed but little in this division throughout the year. At Goose Creek the price was reduced to 90 cents on April 4 on account of flush production, but was advanced again to $1 on August 31.

The following table shows the credit balance quotations for each district of the Gulf coast division for the year 1917:—

District.	Jan. 1.	April 4.	Aug. 31.	Dec. 31.
Batson	$1.00	$1.00	$1.00	$1.00
Dayton	1.00	1.00	1.00	1.00
Goose Creek	1.00	.90	1.00	1.00
Humble	1.00	1.00	1.00	1.00
Markham	1.00	1.00	1.00	1.00
Saratoga	1.00	1.00	1.00	1.00
Sour Lake	1.00	1.00	1.00	1.00
Spindletop	1.05	1.05	1.05	1.05
Edgerly	.95	.95	.95	.95
Jennings	1.00	1.00	1.00	1.00
Vinton	1.00	1.00	1.00	1.00

FIELD STATISTICS.

New Production, Completions, Dry Holes and Number of Wells.

The following tables give the total new production, total completions, number of dry holes and number of producing wells in all districts of the Gulf coast division during 1917:—

Batson.

Month.	Oil.	Dry.	Total.	New prod.
January	3	2	5	150
February	2	1	3	250
March	5	2	7	400
April	5	..	5	110
May	6	2	8	175
June	6	..	6	735
July	7	..	7	250
August	3	..	3	50
September	3	1	4	215
October	2	1	3	60
November	..	..	..	...
December	..	..	..	...
Totals	42	9	51	2,395
Totals, 1916	72	16	88	10,859
Difference	30	7	37	8,464

*Damon Mound.

Month.	Oil.	Dry.	Total.	New prod.
May	1	..	1	5,500
June	..	..	..	...
July	1	4	5	500
August	5	2	7	7,900
September	1	3	4	150
October	1	7	8	500
November	1	3	4	200
December	2	1	3	200
Totals	12	20	32	14,950

*New field brought in during May in Brazoria county.

Edgerly.

Month.	Oil.	Dry.	Total.	New prod.
January	6	..	6	7,800
February	2	2	4	1,250
March	5	2	7	385
April	3	..	3	550
May	3	1	4	4,065
June	1	1	2	40
July	2	2	4	2,100
August	3	..	3	1,275
September	1	..	1	1,500
October	1	..	1	400
November	2	2	4	150
December	4	..	4	1,640
Totals, 1917	33	10	43	21,950
Totals, 1916	43	5	48	39,750
Difference	10	5	5	18,595

Goose Creek.

Month.	Oil.	Dry.	Total.	New prod.
January	9	6	15	15,250
February	11	1	12	26,550
March	21	9	30	43,800
April	27	16	43	29,000
May	26	29	55	25,550
June	37	26	63	42,025
July	36	17	53	24,200
August	25	13	38	39,325
September	28	32	60	29,140
October	39	7	46	25,620
November	15	8	23	7,385
December	10	6	16	11,550
Totals, 1917	284	170	454	319,395
Totals, 1916	37	17	54	23,300
Difference	247	153	400	296,095

Humble.

Month.	Oil.	Dry.	Total.	New prod.
January	22	12	34	6,520
February	25	14	39	7,115
March	18	11	29	5,475
April	23	8	31	1,455
May	25	19	44	2,055
June	16	15	31	5,705
July	16	9	25	4,655
August	18	11	29	7,325
September	16	13	29	6,280
October	11	15	26	2,695
November	14	3	17	6,100
December	12	14	26	225
Totals, 1917	216	144	360	56,605
Totals, 1916	316	164	480	275,920
Difference	100	20	120	219,275

Jennings.

Month.	Oil.	Dry.	Total.	New prod.
January	2	..	2	205
February	1	2	3	75
March	1	1	2	30
April	2	1	3	200
May	2	3	5	325
June	5	1	6	155
July	3	..	3	295
August	..	..	..	...
September	3	2	5	75
October	2	2	4	90
November	2	3	5	110
December	3	..	3	300
Totals, 1917	26	15	41	1,860
Totals, 1916	25	12	37	4,895
Difference	1	3	4	3,025

Markham.

Month.	Oil.	Dry.	Total.	New prod.
January	1	1	2	75
February	..	1	1	...
March	2	..	2	250
April	1	..	1	30
May	2	..	2	55
June	3	..	3	185
July	3	1	4	160
August	..	1	1	...
September	..	3	3	...
October	1	3	4	40
November	..	2	2	...
Totals, 1917	13	12	25	795
Totals, 1916	13	7	20	5,690
Difference	..	5	5	4,905

*New Iberia.

Month.	Oil.	Dry.	Total.	New prod.
May	1	..	1	1,000
June	..	..	..	...
July	..	1	1	...
August	..	4	4	...
September	1	1	2	150
October	..	1	1	...
November	..	..	..	...
December	..	..	..	...
Totals	2	7	9	1,150

*New field in May.

Spindletop.

Month.	Oil.	Dry.	Total.	New prod.
January	2	..	2	55
February	1	1	2	100
March	4	5	5	195
April	2	1	3	15
May	2	1	3	95
June	3	2	5	150
July	2	3	5	135
August	1	1	2	10
September	3	2	5	170
October	3	..	3	285
November	1	1	2	10
December	3	1	4	375
Totals, 1917	27	18	45	1,595
Totals, 1916	22	12	34	922
Difference	5	6	11	673

Saratoga.

Month.	Oil.	Dry.	Total.	New prod.
January	..	1	1	...
February	1	3	4	50
March	5	1	6	235
April	4	3	7	305
May	5	2	7	840
June	5	..	5	220
July	4	1	5	95
August	3	..	3	545
September	6	1	7	90
October	2	1	3	210
November	..	..	..	...
December	..	..	..	...
Totals, 1917	35	13	48	2,590
Totals, 1916	52	12	64	2,050
Difference	17	1	16	540

Sour Lake.

Month.	Oil.	Dry.	Total.	New prod.
January	15	1	16	11,610
February	12	6	18	6,260
March	22	6	28	12,295
April	10	5	15	4,610
May	19	4	23	3,035
June	12	4	16	1,380
July	10	6	16	1,195
August	11	7	18	1,950
September	5	4	9	475
October	13	6	19	965
November	2	..	2	200
December	..	2	2	...
Totals, 1917	131	51	182	43,975
Totals, 1916	113	22	135	61,495
Difference	18	29	47	17,520

Vinton.

Month.	Oil.	Dry.	Total.	New prod.
January	2	2	4	200
February	2	2	6	2,140
March	4	..	4	610
April	3	1	4	4,350
May	3	..	3	8,150
June	2	1	3	250
July	3	2	5	50
August	3	3	6	450
September	3	5	8	270
October	3	1	4	275
November	2	1	3	300
December	..	1	1	...
Totals, 1917	32	19	51	17,045
Totals, 1916	31	11	42	62,710
Difference	1	8	9	55,665

Miscellaneous.

Month.	Oil.	Dry.	Total.	New prod.
January	..	14	14	...
February	..	13	13	...
March	1	9	10	40
April	1	17	18	40
May	2	20	22	20
June	1	30	31	6
July	1	16	17	30
August	..	10	10	...
September	7	14	21	85
October	9	21	30	60
November	4	11	15	30
December	..	..	..	...
Totals, 1917	26	187	213	300
Totals, 1916	31	134	165	415
Difference	5	43	48	115

Daily Synopsis.

The following table is a synopsis of drilling operations for the year 1917, showing the total number of wells completed, number of producing wells, dry holes and total quantity of maximum production developed in the Gulf coast division during the year:—

District.	Oil.	Dry.	Total.	New prod.
Batson	42	9	51	2,395
Damon Mound	12	20	32	14,950
Edgerly	33	10	43	21,950
Goose Creek	284	170	454	319,395
Humble	216	144	360	56,605
Jennings	26	15	41	1,860
Markham	13	12	25	795
New Iberia	2	7	9	1,150
Spindletop	27	18	45	1,595
Saratoga	35	13	48	2,590
Sour Lake	131	51	182	43,975
Vinton	32	19	51	17,045
Miscellaneous	26	187	213	300
Totals, 1917	879	675	1,554	484,605
Totals, 1916	731	412	1,163	488,640
Difference	148	263	391	4,035

North and Central Texas Drilling Synopsis.

The following table is a synopsis of drilling operations for the year 1917, showing total number of wells completed, number of producing wells, dry holes and total maximum initial production developed in the year in North and Central Texas:—

Districts.	Oil.	Dry.	Total.	New prod.
Electra	172	40	212	22,273
Burkburnett	431	109	530	22,560
Petrolia	7	9	16	815
*Miscellaneous	45	68	113	2,205
Totals, 1917	655	226	871	47,853
Totals, 1916	515	115	630	54,740
Difference	150	111	241	6,887

*Includes Thrall, Moran, Strawn and other North and Central Texas districts.

North and Central Texas Production, Etc.

The following tables give the total new production, total completions, number of dry holes and number of producing wells in all districts of North and Central Texas during 1917:—

Electra.

Month.	Oil.	Dry.	Total.	New prod.
January	9	1	10	3,110
February	20	1	21	2,170
March	15	4	19	2,150
April	14	5	19	760
May	23	2	25	2,740
June	24	3	27	4,310
July	8	2	10	765
August	11	12	13	703
September	8	7	15	250
October	11	3	14	2,980
November	17	6	23	1,090
December	12	4	16	1,245
Totals, 1917	172	40	212	22,273
Totals, 1916	130	34	264	40,100
Difference	58	6	52	17,827

Burkburnett.

Month.	Oil.	Dry.	Total.	New prod.
January	20	..	20	374
February	13	4	17	151
March	25	7	32	256
April	35	8	43	379
May	41	9	50	1,427
June	53	10	63	923
July	36	14	50	2,311
August	35	12	47	4,294
September	51	17	68	2,360
October	45	9	54	4,263
November	52	10	62	2,470
December	25	9	34	3,310
Totals, 1917	431	109	530	22,560
Totals, 1916	169	32	201	11,110
Difference	262	77	329	11,450

Petrolia (Clay County).

Month.	Oil.	Dry.	Total.	New prod.
January	..	..	..	...
February	1	3	4	105
March	1	..	1	50
April	..	..	..	...
May	..	..	..	...
June	..	..	..	...
July	2	..	2	325
August	..	2	2	...
September	2	..	2	300
October	1	2	3	35
November	..	1	1	...
December	..	..	..	...
Totals, 1917	7	9	16	815
Totals, 1916	19	7	26	600
Difference	12	2	10	215

*Miscellaneous.

Month.	Oil.	Dry.	Total.	New prod.
January	13	5	18	380
February	5	4	9	75
March	3	9	12	145
April	1	6	7	125
May	1	9	10	25
June	6	8	14	245
July	2	3	5	10
August	5	3	8	215
September	2	2	4	55
October	2	7	9	600
November	3	12	15	300
December	2	..	2	30
Totals, 1917	45	68	113	2,205
Totals, 1916	97	42	139	2,840
Difference	52	26	26	635

*Includes Thrall, Strawn, Moran and other North and Central Texas districts.

Production by Fields by Months.

The following tables give the production of each field in North and Central Texas for the year 1917 by months and for the entire year, together with the combined total output of all fields in the division for each month and the entire year:—

North and Central Texas.

1917.	Electra.	Burkburnett.	Holliday.	Petrolia.
Jan.	534,310	196,380	2,945	18,785
Feb.	498,220	199,185	3,180	21,340
March	509,200	211,215	3,265	23,510
April	501,370	212,745	3,310	23,420
May	493,815	209,370	3,145	24,125
June	541,015	239,875	3,850	24,760
July	544,330	251,810	4,850	25,135
Aug.	519,625	374,270	5,190	26,180
Sept.	497,430	390,580	5,515	27,365
Oct.	493,515	411,685	5,240	28,120
Nov.	468,725	443,400	3,300	24,450
Dec.	468,725	444,670	3,915	24,830
Totals	6,070,305	3,585,185	47,705	292,020
1916.	6,463,380	2,088,025	.....	322,665
	393,075	1,497,160	.....	30,645

1917.	Iowa Park.	Corsicana.	Moran.	Strawn.
Jan.	2,850	21,890	9,460	8,160
Feb.	3,135	19,495	8,365	8,730
March	2,985	23,875	9,540	8,665
April	3,165	21,385	8,730	10,615
May	2,730	22,620	8,365	8,770
June	2,050	23,525	6,485	30,160
July	1,915	24,630	5,980	19,825
Aug.	2,145	22,635	4,115	37,560
Sept.	2,340	21,620	3,505	38,775
Oct.	2,495	22,435	3,270	41,825
Nov.	3,300	24,300	5,550	63,000
Dec.	2,480	25,500	5,325	87,500
Totals	31,590	273,900	78,690	363,585
1916.	19,700	233,385	163,570	157,240
	11,890	59,485	104,880	206,345

1917.	Thrall.	All others.	Total.
Jan.	17,655	180	812,615
Feb.	16,835	195	778,680
March	16,140	250	808,645
April	18,325	210	803,275
May	15,150	200	788,290
June	14,275	180	886,175
July	12,570	250	891,285
Aug.	11,850	240	1,003,810
Sept.	10,425	260	997,815
Oct.	9,860	35,735	1,054,180
Nov.	8,250	37,250	1,081,650
Dec.	14,610	39,100	1,116,655
Totals	165,945	114,050	11,022,975
1916.	507,595	.....	10,055,560
	331,650	.....	1,067,415

Total Production.

Total production for the year 1917 for the State of Texas:—

North and Central Texas	11,022,975
South Texas	22,083,420
Total	33,106,395
Total, 1916	28,082,570
Increase, 1917	5,023,825

North Louisiana Production by Fields.

The following tables give the production of each field in Northwest Louisiana for the year 1917 by months and for the entire year, together with the combined total output of all fields in this district and the entire year:—

Northwest Louisiana.

1917.	Caddo, light.	Caddo, heavy.	De Soto-Red River.	Total.
Jan.	376,215	68,796	303,470	748,480
Feb.	348,240	54,960	291,535	694,735
March	359,715	47,820	287,545	694,735
April	343,520	69,760	219,135	632,415
May	346,485	71,355	262,240	680,080
June	377,490	82,670	312,515	772,675
July	386,545	97,715	319,480	803,740
Aug.	460,200	125,380	248,535	834,115
Sept.	440,815	129,730	226,385	796,930
Oct.	401,850	172,240	223,935	798,025
Nov.	210,356	99,600	114,450	424,400
Dec.	218,530	114,680	154,340	487,550
Totals	4,269,955	1,134,505	2,963,565	8,368,025
1916.	4,746,600	788,315	6,293,430	11,828,345
	476,645	356,190	3,329,865	3,460,320

Caddo.

Month.	Oil.	Dry.	Total.	New prod.
January	13	5	18	470
February	13	4	17	915
March	12	4	16	1,875
April	19	2	21	3,340
May	32	6	38	3,330
June	23	3	26	2,735
July	21	4	25	4,680
August	29	3	32	4,395
September	26	6	32	9,975
October	30	1	31	4,320
November	6	1	7	2,480
December	5	1	6	7,275
Totals, 1917	229	40	269	45,790
Totals, 1916	207	37	244	10,780
Difference	22	3	25	35,010

De Soto.

Month.	Oil.	Dry.	Total.	New prod.
January	2	2	4	375
February	2	..	2	170
March	3	2	5	2,040
April	2	2	4	150
May	7	3	10	335
June	4	..	4	3,535
July	13	2	15	1,560
August	4	1	5	95
September	2	..	2	40
October	1	2	3	65
November	..	1	1	...
December	..	1	1	...
Totals, 1917	40	16	56	8,365
Totals, 1916	60	31	91	15,755
Difference	20	15	35	7,390

Red River.

Month.	Oil.	Dry.	Total.	New prod.
January	3	2	5	365
February	5	2	7	800
March	1	2	3	85
April	3	3	6	140
May	7	2	9	670
June	..	..	..	...
July	3	1	4	300
August	3	1	4	120
September	1	..	1	25
October	1	..	1	65
November	1	..	1	25
December	1	..	1	10
Totals, 1917	29	13	42	2,605
Totals, 1916	94	26	120	25,450
Difference	65	13	78	22,845

Bossier.

Month.	Oil.	Dry.	Total.	New prod.
January	..	2	2	...
February	1	3	4	60
March	4	..	4	50
April	..	2	2	...
May	1	4	5	10
June	..	2	2	...
July	..	1	1	...
August	..	1	1	...
September	3	..	3	10
October	..	2	2	...
November	1	..	1	100
December	..	3	3	...
Totals, 1917	10	20	30	240
Totals, 1916	10	12	22	840
Difference	..	8	8	600

Miscellaneous.

Month.	Oil.	Dry.	Total.	New prod.
January	1	10	11	10
February	..	15	15	10
March	1	7	8	6
April	..	7	7	...
May	..	5	5	...
June	..	8	8	...
July	..	2	2	...
August	1	6	7	2
September	..	..	..	...
October	5	2	7	25
November	..	1	1	...
December	..	..	..	...
Totals, 1917	8	63	71	54
Totals, 1916	2	70	72	120
Difference	6	7	1	77

Drilling Synopsis by Districts.

The following table is a synopsis of drilling operations for the year 1917, showing total number of wells completed, number of producing wells, dry holes and total maximum production developed in the year in North Louisiana:—

Districts.	Oil.	Dry.	Total.	New prod.
Caddo	229	40	269	45,790
De Soto	40	16	56	8,365
Red River	29	13	42	2,605
Bossier	10	20	30	240
Miscellaneous	8	63	71	43
Totals, 1917	316	152	468	57,043
Totals, 1916	373	176	549	55,946
Difference	57	24	81	1,902

Total Production in State of Louisiana.

Total production for the year 1917 for State of Louisiana:—

North Louisiana	8,368,025
South Louisiana	2,966,878
Totals	11,334,900
Total, 1916	14,795,220
Decrease, 1917	3,460,320

Credit Balance Quotations.

Nearly all oil in Northwest Louisiana is sold under credit balance quotations, although some is contracted for at 25 cents higher per barrel under yearly contracts. The following table shows the changes and date of change in credit balance quotations during the year 1917:—

Northwest Louisiana.

District.	Jan. 1.	Jan. 3.	Jan. 8.	Jan. 23.	Mar. 9.
Caddo, light	$1.30	$1.50	$1.60	$1.70	$1.80
Caddo, heavy	.85	.85	.85	.95	.95
Crichton	1.00	1.10	1.20	1.30	1.40
De Soto	1.20	1.40	1.50	1.60	1.70
District.		Mar. 14.	Mar. 17.	Aug. 22.	Dec. 31.
Caddo, light		$1.80	$1.90	$2.00	$2.00
Caddo, heavy		1.00	1.00	1.00	1.00
Crichton		1.40	1.50	1.50	1.50
De Soto		1.70	1.80	1.90	1.90

Credit Balance Quotations.

In North and Central Texas about half the oil is run to credit balance prices, the balance being contracted at about 25 cents per barrel higher. The following table shows the changes and date of credit balance quotations for the year 1917:—

North and Central Texas.

District.	Jan. 1.	Jan. 4.	Jan. 8.	Jan. 13.	Aug. 1.
Burkburnett	$1.30	$1.50	$1.60	$1.70	$1.70
Corsicana, ligh.	1.30	1.50	1.60	1.70	1.70
Corsicana, heavy	.70	.80	.85	.90	.95
Electra	1.30	1.50	1.60	1.70	1.70
Henrietta	1.30	1.50	1.60	1.70	1.70
Moran	1.30	1.50	1.60	1.70	1.70
Strawn	1.30	1.50	1.60	1.70	1.70
Thrall	1.30	1.50	1.60	1.70	1.70
District.		Aug. 7.	Aug. 16.	Aug. 20.	Dec. 31.
Burkburnett		$1.70	$1.90	$1.90	$2.00
Corsicana, light		1.70	1.90	1.90	2.00
Corsicana, heavy		1.00	1.05	1.05	1.05
Electra		1.70	1.90	1.90	2.00
Henrietta		1.70	1.90	1.90	2.00
Moran		1.70	1.90	1.90	2.00
Strawn		1.70	1.90	1.90	2.00
Thrall		1.70	1.90	1.90	2.00

TO STOP FLOODING.

Kentucky Oil Men Carefully Plugging All Abandoned Wells.

Great precaution is being taken by the new oil men over the Kentucky petroleum fields, to see that all wells that are abandoned are properly plugged, for if a well is not properly plugged the fresh water is liable to get into the producing sand and drown out the petroleum. The statutes of Kentucky have a stringent law on this matter and contain the following provisions relating to such wells:—

3910. Petroleum, Natural Gas and Salt Water Wells:—That from and after the passage of this act any person or corporation, and each and every one of them in possession, whether as owner, lessee, agent or manager of any well in which petroleum, natural gas or salt water has been found, shall, unless the said product is sooner utilized, within a reasonable time, not, however, exceeding three months from the completion of said well, in order to prevent said product wasting by escape, shut in and confine the same in the said well until such time as it shall be utilized. Provided, however, that this section shall not apply to gas escaping from any well while it is being operated as an oil well, or while it is used for fresh or mineral water.

3911. How Abandoned Wells Should Be Closed:—That whenever any well shall have been put down for the purpose of drilling or exploring for oil, gas or salt water, upon abandoning or ceasing to operate the same, the person or corporation in possession of the aforesaid shall, for the purpose of excluding all fresh water from the gas-bearing rock, and before drawing the casing, fill up the well with sand or rock sediment to a depth of at least 20 feet above the rock which holds the oil, gas or salt water, and drive a round, seasoned wooden plug, at least three feet in length, equal in diameter to the diameter of the well below the bottom of the casing; and immediately after drawing the casing shall drive a round seasoned wooden plug, at a point just below where the lower end of the casing rests, which plug shall be at least three feet in length tapering in form, and of the same diameter at the distance of 18 inches from the smaller end as the diameter of the hole, below the point at which it is to be driven. After the plug has been properly driven, there shall be filled on top of the same sand or rock sediment to the depth of at least five feet.

3912. Penalty for Violation of Provision of This Law.—Any person or corporation who shall violate any of the provisions of sections 3910 or 3911 shall be liable to a penalty of $100 for each 30 days during which said violation shall continue; and all such penalties shall be recovered with cost of suit, in a civil action or actions, in the name of the State, for the use of the county, in which the well shall be located.

WYOMING'S OIL PRODUCTION IN 1917
$21,031,415 More Than Year Before

9,460,000 Barrels, Valued at $52,030,000, Record for Period—Confidentially Expected to Become Greatest Petroleum Field in the World.

Wyoming, a treasure house of Natu ward upon 1917 as the fattest of the for "Unprecedented prosperity" is a hackn aptly describes economic progress by t conditions were favorable for nearly ev the end of the year every division of i increase in revenue over the preceding produced a total income of $304,855,630, w income of 1916, or a per capita productio of $108 for 1916.

The mineral production of Wyoming growth. The mineral production for th $52,030,000 represents oil, but only that refined, and not the shut in wells actu is a comparative statement of Wyomin re on the Continent's crest, looks backty-seven years of its industrial history. eyed phrase but there is none which so he State during the last year. Local ery line of industrial endeavor and at ndustrial activity shows a gratifying year. Wyoming's industries during 1917 hich is $75,758,366 greater than the total n of $1,024 for 1917, against a per capita for 1917 is quite an item in the State's e year was valued at $80,394,160, of which oil production that was handled and al production and value. The following g's mineral production in 1917 and 1916:

Products—	Production, 1917.	Value.	Value Production, 1916.	Increase, 1917.
Oil (bbls.)	9,460,000	$52,030,000	$30,998,585	$21,031,415
Coal (.tons)	9,509,574	22,108,360	12,638,049	9,470,311
Iron (tons)	985,000	2,216,350	1,400,000	816,250
Copper	.....	1,000,000	600,000	400,000
Gold	.....	30,000	25,000	5,000
Silver	.....	10,000	5,000	5,000
Miscellaneous, including sulphur, plaster, cement, building stone, phosphate rock, medicinal mud, mineral waters, gravel, talc, semi-precious stones, etc.	.....	3,000,000	2,000,000	1,000,000
Totals	.....	$80,394,610	$47,666,634	$32,727,976

Crude Oil.

The development of Wyoming's oil resources provided the most spectacular feature of its industrial progress during 1917. Virtually of negligible importance seven years ago, the production of oil at the end of 1917 dominates all other commercial activities of the State. No other department of Wyoming industrial endeavor during the last year produced so much revenue, a fact which becomes more remarkable when it is realized that development of the State's oil resources barely has begun. The State during the last year produced and marketed 9,460,000 barrels of oil of the estimated refined value of $52,030,000, yet probably less than one-half of the maximum developed production is finding refining facilities, and this maximum represents but an infinitesimal fraction of the undeveloped possible maximum.

The expansion of the Wyoming oil industry in 1917 supplied the most remarkable phase of the State's industrial progress. "Booming" is the only word which adequately describes the condition of this industry during the year. Feverish activity characterized the development of the older oil fields of the State. Scores of new fields were discovered and their development on a comprehensive scale was undertaken. Thousands of persons from other States, attracted by the fame of the Wyoming fields, old and new, and lured by the possibilities of acquiring fortunes quickly, poured in. Capital was nearly as willing. From every American State and from foreign countries came money in a steady stream, to be staked upon the possibility of striking oil. Millions of dollars went into the industry and millions of dollars came out of it. So rapid were the innumerable developments that efforts comprehensively to keep track of them signally failed. At the end of the year there is available from no sources accurate statistics regarding the number of wells drilled for oil during the year, the number of wells which struck oil, the amount of money expended in drilling, the amount of oil production developed. The best that may be done in endeavoring to review the industry during the year is to resort to conservative estimates based upon the information which is available, and much of this information is disconcertingly fragmentary. Two facts stand out boldly: First, that Wyoming, in view of what has transpired during the last year, may reasonably be expected to become the greatest oil-producing area of the world; and, second, that Wyoming has gone "oil crazy."

Refinery Production.

Wyoming refineries during 1917 treated 9,400,000 barrels of crude oil, all of which came from wells within the State. This was an increase of 3,300,883 barrels over the refinery output of 1916, 6,159,117 barrels. The crude oil was worth to the producer an average price of $1 per barrel, or $9,400,000; the refined product was worth probably $5.50 a barrel, or $52,030,000.

The volume of crude oil marketed in Wyoming in 1917 was 53.58 per cent greater than the volume of that marketed in the State in 1916; the value of the refinery output in 1917 was 67.8 per cent greater than that of the output of the preceding year. These figures, however, do not convey an adequate comprehension of the growth of the State's oil industry during 1917. Refining and transportation facilities have not kept pace with developed supply. While at the end of the year approximately 50,000 barrels of crude oil is being refined daily, it is necessary, because of the inadequacy of refining and transportation facilities, to shut in the wells a production which, if released, would run to 28,000 barrels additional. In other words, at the end of 1917 Wyoming's developed oil production is 78,000 barrels daily; 28,470,000 barrels annually. This production, if marketed at present prices, would be worth annually to the producer $28,470,000; to the refiners, $156,585,000. If the refineries were in a position to handle the present shut-in production, the income of the Wyoming producers would be increased $28,000 daily; that of the refiners, $154,000 daily.

Refining Booming.

The Wyoming refining industry, which, as the result of the development in 1917, is another way of speaking of the Standard Oil interests, is exerting all possible efforts to meet the growing production of crude and to hold the complete control of the crude market in the State which it now enjoys. The refineries at Casper and Greybull were enlarged during 1917 and at the end of the year are in process of much greater enlargement. The allied pipe line interests also are exerting their resources to the end that they may be able to transport the increased production from the fields to the refineries. The Illinois Pipe Line Company during 1917 laid a line from the Big Muddy field to the Casper refineries, constructed a line from the cracking plant at Chatham to the refinery at Greybull, a distance of 50 miles, thereby connecting the heavily producing Grass Creek field directly with the refinery, and is now engaged in connecting the Elk Basin field, another heavy producer, with the Greybull refinery, a pipe line about 50 miles in length being necessary to accomplish this. Before the close of 1918 the pipe line capacity between the Salt Creek field, which produces well above one-half of the State's oil output, and the refineries at Casper will have been doubled. With the Big Muddy, Elk Basin, Grass Creek and Salt Creek fields directly coupled up with the refineries at Casper and Greybull, only the odds and ends of the State's crude production are not accounted for by the Illinois system. A new line, not connecting with the Casper refineries, but with the Chicago & Northwestern Railroad leading thereto, will open up the Pilot Butte field, a producer of increasing importance, within the next few months. It will be about 40 miles in length.

Independent Development.

That the monopoly enjoyed by the present refining interests will not continue through the new year is indicated by the activities of several independent refinery companies which have been organized and which will erect plants during 1918. Glenrock, at the eastern edge of the Big Muddy field; Lander, the center of the ring of the less-developed fields; Riverton, adjacent to the Pilot Butte and several other fields; Thermopolis, the center of a rapidly developing oil territory; Fort Steele, gateway to the Lost Soldier field, and several other spots have been selected as sites for small independent refineries. If these small refineries measure up to the promises of the projectors, however, they will be able but feebly to challenge the established refining interests and their completion will not result in any considerable measure of the relief for which the independent producers of the State are clamoring. There will have to be a far greater readjustment of the refining situation than these plants can bring about before Wyoming independent producers, now compelled to sell their crude at the average price of $1 per barrel, will be able to demand the higher prices at which less valuable crude is selling in other States. One thing must be remembered among the independent producers, that Wyoming is far away from the more Eastern markets, the logical terminus for the refined product of this country, and it costs a mint more of money to ship the product to the Atlantic coast from Wyoming than it does from points where pipe lines are leading to the coast. The time will come, and that is short, when better prices will prevail for Wyoming crude, but that time will be when a line extends from the Wyoming field to where it will connect with some line running from the Oklahoma and Kansas fields to the Atlantic seaboard. Better prices always prevail for the crude product when a pipe line runs from the field to the seaboard connections. All fields west of Pennsylvania have gone through just what Wyoming is going through today. All the independent refineries that could be built in Wyoming would not change things until the needed trunk pipe line is connected up with Wyoming fields. This has been the history of all other fields and will naturally be the history of Wyoming repeated.

Fields of Wyoming.

A review of the activities in the various fields of the State during 1917 is impossible in an article of this length. The fields in which the greatest activity centered were those of Converse, Natrona, Fremont, Hot Springs, Big Horn and Park counties. The leading fields, in the order named, were the Salt Creek, Grass Creek, Elk Basin, Big Muddy and Greybull, which account for all but the odds and ends of the State's production. The development of the Big Muddy pool, relatively speaking, was more rapid than that of any other in the State. Of the lesser fields those to which prominence attached during the year included the Tisdale, Powder River, Pilot Butte, Glenrock, Hidden Dome, Little Buffalo Basin, Lusk, Big Hollow, Lost Soldier, Fossil, Big Piney, Cow Creek, Buck Creek and several of the numerous fields of Fremont county. The Lost Soldier and Pilot Butte fields, which are among the most remote in the State, developed so rapidly that each will have pipe line outlet in 1918, or just as soon as weather settles and work can start on lines. Toward the end of 1917 the southwestern fields, which include the Spring Valley, Fossil, LeBarge and Piney, which prior to that time had been eclipsed by the fame of the fields of the central and northern portion of the State, began to attract attention, particularly from Salt Lake and Pacific Coast interests.

There are now in Wyoming probably 550 wells which are capable of production, their capability running from five to 1,000 barrels daily, and some above that figure. Probably 350 wells were started during the year with rigs capable of going from 800 to 5,000 feet. In addition to these, thousands5 of so-called "validating holes" were sunk on oil placer claims with light rigs. Probably 3,000,000 acres were covered by oil placer locations during the year. The output of the producing wells for which there is refinery outlet is enabling Wyoming at this time to produce about 8 per cent of the gasoline output of the United States.

Wyoming Invaded.

Among the large concerns operating elsewhere which entered Wyoming during the last year are the Union Oil Company of California, the Prairie Oil & Gas Company, of Kansas, and the Royal Dutch-Shell combination, the latter being represented in Wyoming by a subsidiary, the Roxana Petroleum Company. The Roxana company, while in the State only during the latter part of the year, already has become one of the most active developers of Wyoming fields, its operations extending to all the better prospective fields.

The Midwest Refining Company during the year increased its capitalization from $20,000,000 to $50,000,000. Several of the other large concerns materially increased their capitalization and there were a number of important mergers, from two to five producing concerns combining their holdings in each and taking up outstanding stock with stock of the merger issue. The Ohio Oil Company is one of the largest operating concerns in the State and is the largest in the United States.

The State of Wyoming, which previously had leased State-owned oil lands on the 10 per cent royalty basis, increased its royalty to one-eighth, or 12½ per cent, in all leases issued during the last few months of the year. The demand for State leases increased in pace with development of the older fields and the discovery of new fields, and the business of the ex-officio land boards now is so heavy that there may be submitted to the next Legislature a bill for a constitutional amendment relieving elective State officials from their duties as ex-officio land board members and creating elective or appointive land boards.

The number of wells drilled in Wyoming in 1917 probably exceeded 150. Sixty wells were drilled in during the last four months of the year.

Wyoming's Known Oil Domes.

At the close of 1917 the number of distinct domes in Wyoming on which drilling is in progress, or on which drilling has begun but has been discontinued until the passing of winter, or arrangements for the drilling of which have progressed to the point where machinery either is on the ground or has been secured and will be placed on the ground early in the spring, has increased to a total of 155. This is three times as many domes as had been discovered in the State at the end of 1916, a fact conveying a definite idea of the activity of oil prospectors during the last year. In addition to the 155 domes mentioned herein, there are scores of suspected domes which have been located and which will be prospected during 1918. Every county of the State, and there are 21 counties, possess one or more domes on which drilling has been started or will be started early in the spring. There are five counties which have from 10 to 27 domes. Natrona county heads the list. The 155 domes which are being drilled or which will be drilled as soon as spring weather sets in, and the counties and their location, follow:—

Natroma County Domes.

Salt Creek, Teapot, Powder River, Tisdale, Gothberg, Denver, Cottonwood Creek, Shepherd, Castle Creek, Lane, North Casper, Natrona, Wilson, Powder River Junction, Boone, Midway, Emigrant Gap, Pine, Notches, Poison Spider, Rattlesnake, Oil Mountain, Bates, Alcova, Iron Creek, Hett and West Big Muddy, twenty-seven domes in all.

Fremont County Domes.

Sheep Mountain, Sweetwater, Big Sand Draw, Dallas, Dutton, Conant Creek, Lander, Missouri Valley, Buck Springs, Sage Creek, Winkleman, Pilot Butte, Muskrat, Shaad, Lost Cabin, Alkali Butte, Government Draw, Lost Well, Schoonmaker and Maverick Springs, 20 domes in all.

Converse County Domes.

Careyhurst, Lightning Creek, Cheyenne River, Cole Creek, Big Muddy, Glenrock, Brenning Basin, Fetterman, Wagon Hound, Box Elder, Flattop, North Douglas, South Douglas, Brown Springs, Old Woman and Poison Lake, 16 domes in all.

Big Horn County Domes.

Renner, Bonanza, Manderson, Torchlight, Basin, Greybull, Lovell, Adobe, Shell, Bear Creek, Hoye, Gyp, Sherard and Burlington, 14 domes in all.

Park County Domes.

Elk Basin, Badger Basin, Byron, Cody, Oregon Basin, Rawhide, Gooseberry, Little Buffalo Basin, McMahan and Sunshine, 10 domes in all.

Carbon County Domes.

Dana Ridge, Mahoney, Carbon, Simpson Ridge, Medicine Bow, Saratoga, South Muddy Creek, Como, Pick Springs, Miller Hill, Fort Steele and Greenville, 12 domes in all.

Hot Springs County Domes.

Warm Springs, Lucerne, Thermopolis, Otey, Wagon Hound, Grass Creek, Hamilton and Shafer, eight domes in all.

Niobrara County Domes.

Cow Creek, North Lusk, Lance Creek, Lusk, East Muddy Creek, Van Tassell, Buck Creek and Manville, eight domes in all.

Albany County Domes.

Toltec, Diamond, Hutton Lake, Big Hollow, Howell, McGill and Cooper, seven domes in all.

Washakie County Domes.

Tensleep, Bud Kimball, Hidden, Summit, Nelber and Worland, six domes in all.

Sweetwater County Domes.

Baxter, Rock Springs, Lost Soldier, Buffalo Basin and Lost Creek, five domes in all.

Lincoln County Domes.

Fossill, LeBarge, Big Piney, Cumberland and Seate Creek, five domes in all.

Crook County Domes.

Sundance, Moorcroft, Thornton and Pine Ridge, four domes in all.

Weston County Domes.

Upton, East Newcastle and South Newcastle, three domes in all.

Platte County Domes.

Wheatland, Platte River and Glendo, three domes in all.

Johnson County Domes.

Murphy Creek, Billy Creek and Shannon, three domes in all.

Campbell County Dome.

Nine-Mile dome.

Sheridan County Dome.

Palmer dome.

Goshen County Dome.

Meriden or John Bunn dome.

Laramie County Dome.

Cheyenne dome.

Uinta County Dome.

Spring Valley dome.

Many Wildcat Companies.

Wyoming during the last year was a fertile field for promoters of "wildcat" oil companies. The use of wildcat in this connection should not be confused with the application of the term to a well drilled for oil in unproven territory. The "wildcat" driller may strike oil (although the probability that he will do so is small, statistics showing that only one out of every 13 "wildcat" wells drilled on definite structures "comes in"), he takes a chance and spends money on actual development in an attempt to strike oil. The "wildcat" corporation promoter strikes only the pocketbook of unwary investors; that is his object, and his object achieved he is through; he takes no chances.

While the exact figures are not available at this writing, the par value of the stocks of oil companies chartered by the State of Wyoming during 1917 is about $385,000,000. This means that during the last year authorization was given for the issuance of oil stocks in an amount averaging, at par value, $1,060,000 a day. The average capitalization of the companies chartered probably was about $750,000. The average company, upon the date of its organization, did not own property worth one-tenth of $750,000, nor for that matter, in all probability, one one-hundredth of that amount. Imagination need not be vivid, therefore, to surmise the actual value of the average investor's Wyoming oil stock holdings.

How much was paid by investors for their holdings of stock of oil companies incorporated in Wyoming during the last year is too problematical for an estimate to be hazarded with any claim that it is reasonably accurate. Some stocks sold at several times their par value, a small percentage sold at one-half of par or better, a considerable sold at one-quarter of par or better, and the remainder, constituting the bulk of the total, sold at from 1 per cent of the par value to 25 per cent of par value. If 10 per cent of the par value arbitrarily is accepted as the average price at which the stock was marketed, then investors in the stocks of Wyoming oil companies organized during the last year paid $38,500,000 for their holdings. The value of the crude oil from Wyoming wells which was marketed last year was about 26 per cent of $38,500,000, and had it been produced and marketed by the companies incorporated in 1917 would have amounted to a fair proportion of the return anticipated by the average investor in the stock of these companies. Unfortunately for these investors, however, a very small portion of the State's production in the year came from wells owned by companies incorporated in 1917 and the dividends, so alluringly represented by "wildcat" promoters to be certain to accrue, did not materialize and will not materialize hereafter. Discussing the situation along this line, one of the best informed conservative investors in Wyoming oil stocks, a man who has made a fortune out of such investments during the last year, recently said:

"Remember that there are over 500 companies in the field now advertising and selling stock, that nine out of ten of them will ultimately fail, and probably less than 25 have a fair chance for success.

His statement was not intended, and nothing herein is intended, to disparage companies with a legitimate basis for their issues of stock. Scores of persons have been made rich during the last year by their investments in Wyoming oil, and hundreds of others will make fortunes out of Wyoming oil investments, but there is a distinction with a vital difference between an investment in oil and an investment in oil stock. An investment in oil stock may be an investment in oil, but is not necessarily so, and with lamentable frequency is not so; "wildcat" wells in Wyoming made some fortunes in the last year and will make more fortunes, but "wildcat" stocks of companies of the character of so many that were incorporated in Wyoming in 1917 made no fortunes and will make none—except for the promoter.

So detrimental to the efforts of legitimate operators have become the brazen activities of "wildcat" promoters and the growing public distrust of oil securities in general which is resulting from these activities that there seriously has been advanced the proposal that the Wyoming Legislature be convened in special session to pass legislation designed to prevent further knavish oil-stock flotations.

Wyoming's Oil Center.

Casper is the real oil center of Wyoming. Where hard luck is never heard, where no one has a tale of lost opportunities, where the "to rent" sign is never seen, where every man, woman and child has more than plenty of work to do, where even the politician is too busy to seek an office and political offices search day and night for a man to fill them, where every line of industry finds immediate and steady employment, where paved streets are brilliantly lighted, where the curb for block after block is lined with high-priced automobiles, where a traffic cop strains and sweats in directing a steady flow of vehicles, where the main thoroughfares are lined at all hours of the day with a heavy stream of pedestrians, where there are excellent hotel accommodations crowded week in and week out with guests, where are still found the famous cowboys of the frontier days, wealthy cattlemen, wealthy sheepmen, wealthy oil men, where railroad yards are bursting with freight, where everybody is so prosperous that the very air seems laden with prosperity, where wealth pours in to citizens in return for resources that have only been scratched, and where the promise of a golden harvest is extended to everybody, is but a poor pen picture of Casper, the oil center and the geographical center of Wyoming.

Like a giant aroused from his sleep Casper is just opening its eyes, and before many days more the entire nation will be gazing at this growing giant of cities. It is surrounded by immensely wealthy grazing lands, sheep and cattle lands, and a world of oil wealth that is just beginning to be realized.

Most people who hear of Casper have drawn a picture of a boom town, where people scramble for money and sleep in shacks, where the music of the dance halls fills the air and the clink of gambling chips and glasses is heard; but far from this is Casper. The evening hours in the hotels see vast crowds of sober men and women, all earnest and active. There is a hum in which is intermittently heard "well," "oil," "rig," "tools," and other expressions of the city's chief industry—oil. In these hotels no less than $300,000 a day changes hands. Some of it is in the buying and selling of stocks, some of it is for the transfer of oil lands, some of it is for real estate, and all of it goes to build a greater Casper.

One sign of the great wealth of Casper is its banks. Unlike most cities of the West, two clearances a day are necessary to relieve congestion. Recently it was announced that the deposits in the banks at Casper were $565 for every man, woman and child in the city, which is probably greater than in any other Western city.

From a little over 4,000 people a year ago, the city has almost over night jumped to a population estimated at 12,000 people. Every train brings in a stream of people, and at train time the stations are crowded with persons going in and out of the city. Over 200 homes are now under construction in the city and more than a dozen office buildings are going up, some seven stories.

Justice is meted out in a new form in Casper. Casper has many things of interest. Its people are noted as early risers. The old customs of the town have not been outgrown, and the newcomers quickly acquire them. The city justice of the peace metes out justice from his seat in the office of his hotel. All offenders of the night before breakfast and appear before his honor at 7 o'clock in the morning, so as to be ready, if they cannot pay their fines, to go to work on the streets with the chain gang by 8 o'clock in the morning.

"The Floppery" is a big circus tent that has been converted into a lodging house. Here are tier upon tier of beds, from which, it is said, the owner realizes $100 per week in profits.

Two large refineries are located in Casper, capable of handling 30,000 barrels of oil daily. The Midwest Refining Company's plant handles the crude oil, being the third largest producer of gasoline in the United States. The Standard Oil Company of Indiana's plant takes the residue and manufactures an immense number of refined products. The refineries employ 1,000 men, 100 of whom are engaged in construction work on the plants, which will shortly be increased to 50,000 barrels a day. The refineries have two 42-mile six-inch pipelines into the Salt Creek field, the largest producing field in Wyoming. The refineries also have an 18-inch pipeline from the Big Muddy field to the refineries. The Midwest company has a line of recent construction from the Salt Creek field to Casper that handles exclusively casinghead gasoline, made in the Salt Creek field.

Fort Steele Outlook.

Fort Steele, Carbon county, the point where the main line of the Union Pacific Railroad crosses the North Platte River, is to be the railroad shipping point for oil from the Lost Soldier field, and eventually may be the refining center of Southern Wyoming. West & Haziett, well known Kansas and Oklahoma oil operators, who recently purchased the Funk holdings in the Lost Soldier field for $360,000, and who are said to represent the Prairie Oil and Gas Company of Kansas and Oklahoma, have announced that a pipeline would be put in from the Lost Soldier field to Fort Steele, having its terminus at a tank farm a short distance west of the railroad station and about half a mile west of the North Platte River. Work on the pipeline and on the storage tanks in the field and at Fort Steele is to begin as soon as the weather permits. The main field tank will have a capacity of 35,000 barrels. The size of the pipe for the line has not as yet been announced. The line will be about 50 miles in length. From Fort Steele the crude oil will be shipped in tank cars, but the destination has not been given out. It may be at Casper and again in Oklahoma.

Fort Steele is not the nearest point at which a pipeline from the Lost Soldier field could reach the railroad, the Union Pacific at Riner being only 36 miles south of the field, but it is the only point on the railroad within 125 miles of the field at which there is available an abundant supply of water, a supply sufficient for large refineries and other industrial plants, and is only the forerunner of the construction of an immense refinery, if oil in quantities is found in the Lost Soldier and nearby fields, for the Prairie Oil and Gas Company does not do things by half. This company made the Kansas-Oklahoma field what it is today and they may do the same with the southern part of Wyoming. This fact undoubtedly caused Fort Steele to be selected as the railroad terminus of the Lost Soldier pipeline. It is logically situated to be the refining center of the south central Wyoming oil fields, of which the Lost Soldier and the Big Hollow are the only ones in which production has been found.

Adjacent to Fort Steele are a number of promising fields which may be connected with that point with pipelines at reasonable expense, some of these, and the distances separating them from Fort Steele, being as follows:—Lost Soldier, 50 miles; Mahoney, 45 miles; Saratoga, 20 miles; Pick Springs, 15 miles; Muddy Creek, 50 miles; Como, 45 miles; Simpson Ridge, 25 miles; Medicine Bow, 30 miles; Diamond, 50 miles; Big Hollow, 70 miles; Howell, 70 miles; Toltec, 70 miles; Alcova, 55 miles, and Bates, 60 miles.

The bringing in of the Funk deep well, with a capacity of 1,000 barrels a day, and several shallow wells in the Lost Soldier field has stimulated activity there, and numerous concerns are drilling or preparing to drill the structure, including the Midwest Refining Company and the Ohio Oil Company, the latter having resumed operations after a shut down of nearly a year. West & Haziett and the Prairie Oil and Gas Company are preparing for an intensive drilling campaign of their extensive holdings.

For many years the district surrounding the thriving and beautifully located town of Lander, the Hub of Fremont county, which incidentally was the first oil field developed in Wyoming, was the butt of many a joke because of the many failures which followed its inception. The failures were due to exploitation for stock selling purposes and not to a deficiency in the capacity of the field, as the events of the last few months have demonstrated. Already the Lander district is a proven success and it should within a few months become a great stabilizer of the oil industry, because of the influence it is sure to exert upon the production of oil for fuel purposes.

The product of the Lander field is a heavy, black oil, carrying rather a low percentage of gasoline, though still enough to warrant its subjection to a "skimming" process for the extraction of gasoline and refined oils. It is because of the demand for the residuum resulting from treatment of the higher grade crude oils of the more prominent fields for cracking into motor spirits that there is a loud cry for heavy oil, and in this respect the Lander field is sure to take a prominent place in the sun. There are three distinct structures under development near Lander, the Dallas, Hudeen and Plunkett structures, and all are producing oil in commercial quantities. The Pilot Butte field is also a part of Fremont county, as are several other well known structures that will soon be tested out. The Sage Creek structure is in the same county, and the supposition is that a large part of Fremont county is underlaid with crude petroleum.

No record of wells finished have been kept in any section of Wyoming, but the present year will no doubt bring about a change, and the regular monthly statistics will soon appear from Wyoming as from other petroleum fields of the country.

1917 WAS CALIFORNIA'S "BIG YEAR" IN THE PRODUCTION OF PETROLEUM

Output Was Close to 98,000,000 Barrels, an Increase of 7,000,000 Barrels—Consumption Was More Than 108,500,000 Barrels.

Los Angeles, Cal., Jan. 5, 1918.

The year 1917 proved to be California's "big year" in the oil industry. The war has created an unprecedented demand for oil produced in the United States, due to the cutting off from the world's supply the oil formerly produced in the Russian, Galician and Roumanian fields. Although this keen demand was felt later in the West, due to the close proximity of the Eastern fields to the war zone, it came with a grand rush during 1917. To meet this great demand it required supreme efforts on the part of all operators engaged in the production of new oil in California, and the adaptation of every advanced method known to conserve oil production. Notwithstanding this, the production was throughout the year less than the consumption, and a total draft on oil in storage was made to the extent of approximately 11,000,000 barrels.

98,000,000 Barrel Production.

Production during the year approximated 98,000,000 barrels, which is the largest total amount of petroleum produced during one year in the history of the oil industry, with the exception of 1914, when gushers were the byword. This is an increase over the production of 1916 of 7,000,000 barrels. The figures in consumption broke all existing records, being slightly more than 108,500,000 barrels, which is more by 4,500,000 barrels than the total for 1916, the previous high water mark. The difference between the production and consumption totals created a draft on stocks of nearly 1,000,000 barrels monthly.

More work was done in the California fields in every branch of field operations during 1917 than ever before. A monthly average of new wells completed totaled 63, bringing with it a monthly average of new production of over 10,000 barrels. Drilling wells were increased during the year from 312 to 382. Producing wells were increased from 6,956 on the first of January, 1917, to 7,742 on the first of January, 1918.

Work Limited by Oil Supplies.

The year was heralded in by conditions which showed promise of making 1917 the most prosperous and active of all years in the oil industry of California. Five advances in the price of oil during 1916 had stimulated drilling to a great extent. The prices of oil supplies necessary to drilling had risen by some 200 per cent. over previous values, but to obtain them was simply a matter of paying for them. It was considered that the advanced price of oil had offset the advance in the prices of drilling commodities. During the year 1917, however, it was soon found that certain materials could not be obtained at any price. Toward the latter part of the year much more new work would have been started had it been possible to secure equipment necessary for the completion of the well. So it can well be said that drilling was limited by the amount of oil well supplies obtainable.

For the first half of the year drilling increased at a rapid rate, but toward the middle of the year work began to slacken. The Standard made frantic efforts to stimulate drilling by making three advances in the prices of all grades of oil throughout the State in rapid succession, which totaled a 25 cent advance. This resulted in keeping production at the rate then existing, but no increase was made to the end of the year.

Refining Increases.

One of the most important advances of the California oil industry during 1917 has been in the refining and manufacturing branch. During 1916, according to the United States Bureau of Mines, 62,950,127 barrels of crude were run by California refineries. The products obtained were as follows:—Gasoline, 309,480,999 gallons; kerosene, 129,186,582 gallons; gas and fuel oil, 1,776,812,422 gallons; lubricants, 41,429,876 gallons; asphalt, 286,208 tons; miscellaneous products, 46,182,985 gallons; losses, 1,000,585 barrels. During 1917, at the same rate maintained during the first six months, the total runs of crude oil by refineries were 73,410,147 barrels. The products obtained were as follows:—Gasoline, 343,403,007 gallons; kerosene, 13,704,585 gallons; fuel and gas oil, 1,921,902,609 gallons; lubricants, 103,604,981 gallons; asphalt, 191,731 tons; miscellaneous products, 82,242,871 gallons; losses, 1,080,141 barrels.

By far the greatest increase in manufacturing was in the making of lubricants. This branch of the industry has been built up from nothing within the last few years, since the dissolution by the Supreme Court of the United States of the old Standard Oil combine. Forced into independence the Standard of California ceased to push Eastern goods and devoted its efforts to lubricants. The home market, too, has grown. The Eastern consumers and refiners, too, have formed a sale for California lubricants, and large quantities have been sent East. Prejudice, fostered to some extent by the inferior quality of some early California lubricants, has been hard to overcome, but the future of the lubricants made from California asphalt base oil is assured.

Most Notable Events.

The most notable events which have been most instrumental in increasing the production in California have been:—The opening of the new districts of Montebello and Repetto Hills near Whittier in the south; the progress of the Casmalia district, near Santa Maria; the work in the new district just north of the city of Ventura on the coast; the extension and increase of production in the new South Mountain district near Santa Paula and the extension and revival of a number of old fields.

On December 6, 1916, the Standard started drilling its first well in the new Montebello field. In February, 1917, oil was found, and since that time twelve companies have secured acreage in that vicinity and are now actively engaged in drilling. At present there are seven producing wells, eighteen drilling wells and two new rigs. The State Mining Bureau states there are probably 2,000 acres which will prove productive at reasonable drilling depths. The field has laid untouched near some of the oldest of developed fields, and has now been opened solely upon indications developed by scientific geological study.

The underground structure appears to be in the form of an elongated dome situated along the line of hills which flank the Olinda, Brea Canyon and Whittier fields and pass more or less cautionsly to the north of Los Angeles and near the Salt Lake field. The latest completed well penetrates lower oil-bearing formations than those developed by the preceding wells. During the year in this field one 8,000-barrel producer and two 2,000-barrel producers were brought in.

The biggest district yet developed on the coast of California during the past two years is at Casmalia, northern Santa Barbara county, where the Doheny Pacific Petroleum and the Associated Oil companies have developed the heaviest oil in the State, ranging from 9 to 13 gravity. Some of the oil is so heavy that only the fact that it comes from the wells at a high temperature has made it possible to handle it. Efforts are being made to develop a cracking process by which this oil may be broken up and raised in gravity to a degree that will permit its being piped. The two companies have a joint production of about 6,500 barrels daily.

Near the city of Ventura wells of the State Consolidated Oil Company and of the Shell Company of California have developed two strata of the lightest oil ever found in the State. The upper stratum yields an oil of 52 to 56 B. gravity and the lower an oil of 36 to 38. The quantity of both is as yet quite small, but the potentialities of the field are large. Together with the oil gas is produced in enormous quantities which is rich with gasoline.

The region around South Mountain, also in Ventura county, has been enlarged during the past year to a large extent. The oil obtained is of exceptionally high gravity, the production of which is accompanied also by great quantities of gas.

Through the efforts of the Petroleum Branch of the California State Mining Bureau many of the old fields have been rejuvenated by advanced scientific methods. Underground water seepages have been cemented off and old wells have been made to increase their production to a considerable extent. Especially is this true of the Santa Maria and Coalinga fields. By deepening wells in the former field production has been increased in some cases by 200 barrels. Coalinga has derived much benefit through the same treatment of many of its old wells.

Casinghead Gasoline.

California now ranks third in the States of the Union as to the quantity of casinghead gasoline manufactured. According to the Geological Survey, California had in 1916 twenty-six plants in operation, valued at $2,293,822. The production was 17,158,754 gallons. The recovery of gasoline per 1,000 cubic feet was 691 gallons.

California's output of casinghead gasoline in 1917 was much greater than in 1916. This increase was in spite of the fact that the construction of the new plants was greatly handicapped by the shortage of material. From all the plants in the State, with the exception of those of the Standard Oil Company in the Midway and Coyote Hills, there is a total daily production of 59,875 gallons. At this rate during 1917 there was produced 21,854,375 gallons. Eight new plants were started during the year 1917.

The Standard policy is to put all the casinghead gasoline back into its oil, transport it in the pipeline to Point Richmond or El Segunda and there to extract it as ordinary gasoline. The exact quantity cannot be obtained owing to this fact, but estimates as to the output, based upon results obtained by other companies using the same method point to a probable production of between 7,000 and 8,000 gallons daily.

1918 Outlook.

Indications point to "rough sledding" ahead for the oil industry in California during 1918. The outlook for a more gracious supply of oil well materials is not very bright; if anything, it will be more difficult to obtain them. On the other hand, should the government devise some scheme to supply the existing demand in these requisites, which is apparently the only thing to do, due to the part petroleum will play in the war, 1918 will be bigger and better in the oil industry than ever before. The oil is here and awaits nothing but the necessary equipment for drilling. Oil prices are high and labor conditions are better than ever before. The demand is bound to increase, but even at that can be supplied if conditions in the availability of oil well supplies are bettered.

Production and Shipments.

Figures prepared and made public by the Independent Producers' Agency at Los Angeles show that the total production of crude petroleum in California during the year 1917 was 97,781,574 barrels, an increase over the total for 1916 of 5,805,555 barrels and a figure never exceeded except in 1914, when the output of the State was 102,871,907 barrels. It was in 1914 that the great Lakeview No. 2 gusher alone produced 7,000,000 barrels, so as far as steady production is concerned, 1917 leads in amount for any year so far that California has produced oil.

The production was not increased during the year to any great extent from month to month, but a steady production was maintained throughout the year which sent the total up. This was accomplished only by drilling to the limit marked by the scarcity of materials which could be said regulated drilling to a large extent in California.

The demand for California oil during 1917 has been unequaled in the history of the industry in this State. A new mark in shipments of 108,764,872 barrels was reached, as compared with 104,312,905 during 1916 and 92,007,715 during 1915. Thus the use of California oil during 1917 was greater by 4,451,967 barrels than during 1916. The exceptional decline in consumption during 1915 was due to the upset by the war of foreign trade, which was not fully straightened until 1916.

The great increase in shipments during 1917 is also directly in the face of the diversion of a large part of the South American trade from California to Mexico, a movement initiated by the California oil men because of the absolute necessity for conserving California oil for the home market.

The demand for fuel oil was probably greater than for any other kind of oil. In May the scarcity of this product was felt keenly, especially by the railroads. Very few of the large refiners had any on hand. Conditions became worse until few of the sellers would quote any price and future contracts would not be made. In the south during the year the price jumped from $1.20 f. o. b. to $1.52, while in the north the price rose to $1.45 per barrel. This stimulated drilling in areas which produced heavy oil, and at the end of the year a slight relief from the tension was noted.

Shipments were as strong in the early part of 1917 as they were the latter part, an even demand being evident throughout the year. The last month's total shipments were less than for any month in the year with the exception of July, which brought the total monthly shortage figure down to less than for any month during the year. The total storage was 10,983,298 barrels during the year, January showing the largest shortage for any one month.

Following is given the production and shipments by months during 1917:—

Production by Months.

Month.	1917.	1916.
January	8,082,090	6,936,785
February	7,324,720	6,522,548
March	8,150,406	7,525,081
April	8,077,402	7,372,480
May	8,084,347	7,724,184
June	7,771,082	7,643,136
July	8,159,988	8,073,307
August	8,562,121	8,079,023
September	8,344,679	8,020,699
October	8,417,597	8,260,357
November	8,284,773	7,880,447
December	8,522,369	7,936,972
Totals	97,781,574	91,976,019
Production, 1916	91,976,019	.....
Increase	5,805,555	.....

Shipments by Months.

Month.	1917.	1916.
January	9,487,882	6,963,161
February	8,691,291	7,191,499
March	9,362,462	8,368,869
April	8,907,847	8,785,715
May	9,067,233	8,829,250
June	9,102,878	8,512,641
July	8,534,872	8,341,119
August	9,330,243	9,548,079
September	8,912,223	9,445,632
October	9,455,295	9,190,114
November	9,234,510	9,468,181
December	8,678,136	9,666,649
Totals	108,764,872	104,312,905
Production, 1916	104,312,905	.....
Increase	4,451,967	.....

Monthly Shortage.

Month.	Production.	Shipments.	Shortage.
January	8,082,090	9,487,882	1,405,792
February	7,324,720	8,691,291	1,366,571
March	8,150,406	9,362,462	1,212,056
April	8,077,402	8,907,847	830,445
May	8,084,347	9,067,233	982,886
June	7,771,082	9,102,878	1,331,796
July	8,159,988	8,534,872	374,884
August	8,562,121	9,330,243	768,122
September	8,344,679	8,912,223	567,544
October	8,417,597	9,455,295	1,037,698
November	8,284,773	9,234,510	949,737
December	8,522,369	8,678,136	155,767
Totals	97,781,574	108,764,872	10,983,298

Summary for 1917.

	Production.	Shipments.	Shortage.
Totals, 1917	97,781,574	108,764,872	10,983,298
Monthly aver'ge	8,148,464	9,063,739	915,275
Daily average.	267,895	297,986	30,091

Summary for 1916.

	Production.	Shipments.	Shortage.
Totals, 1916	91,976,019	104,312,905	12,330,886
Monthly aver'ge	7,664,668	8,692,742	1,028,074
Daily average.	251,989	285,289	33,880

Summary for 1915.

	Production.	Shipments.	Shortage.
Totals, 1915	89,725,776	92,470,715	2,281,939
Monthly aver'ge	7,477,148	7,667,309	190,161
Daily average.	245,824	252,076	6,262

Daily Average.

The daily average production for the year was 267,895 barrels, compared to 251,989 during 1916 and 245,824 during the year 1915. The month of January had a daily average production of 260,713 barrels, which increased to 274,915 barrels, the daily average for December over a twelve-month period. The month of September showed the highest daily average production when oil was produced at a rate of 278,156 barrels, which is the highest monthly production since 1914.

The shipments reached a daily average never before equalled in California, when an average of 297,986 barrels were shipped daily. This is compared to the 1916 figure of 285,789 barrels and the 1915 mark of 252,076 barrels. Although the last month of the year showed a smaller total than the first, yet as a whole an even rate of shipments was made throughout the year.

The daily average shortage started with January showing 45,348 barrels and with December showing a daily average shortage of but 5,025 barrels. The daily average shortage for the year was 30,091 barrels.

Following are the daily average figures in production, shipments and shortage:—

Production.

Month.	1917.	1916.	1915.
January	260,713	223,767	248,333
February	261,597	224,915	248,176
March	262,916	242,744	244,103
April	269,247	245,749	244,563
May	260,785	249,167	247,952
June	259,036	254,771	248,132
July	263,225	260,429	249,634
August	276,197	260,614	247,743
September	278,156	267,356	244,354
October	271,535	266,463	247,586
November	276,159	262,716	240,753
December	274,915	256,031	238,628
Totals	267,895	251,989	245,824

Shipments.

Month.	1917.	1916.	1915.
January	306,061	224,618	233,347
February	310,403	248,051	219,196
March	302,015	269,963	241,076
April	296,928	292,857	239,835
May	292,491	284,814	250,341
June	303,429	283,755	252,868
July	275,318	269,068	246,550
August	300,976	308,002	260,567
September	297,074	314,854	259,293
October	305,010	296,455	277,409
November	307,817	315,606	276,486
December	279,940	311,827	265,409
Totals	297,986	285,789	252,076

Shortage.

Month.	Production.	Shipments.	Shortage.
January	260,713	306,061	45,348
February	261,597	310,403	48,806
March	262,916	302,015	39,099
April	269,247	296,928	27,681
May	260,785	292,491	31,706
June	259,036	303,429	44,393
July	263,225	275,318	12,093
August	276,197	300,976	24,779
September	278,156	297,074	18,918
October	271,535	305,010	33,475
November	276,159	307,817	31,658
December	274,915	297,940	5,025
Totals	267,895	297,986	30,091

PRODUCTION BY FIELDS.

Valley Section.

The Midway-Sunset field produced more oil in 1917 than any other individual field, the total reaching 37,064,435 barrels. Although this total is less by 2,526,568 barrels than the total for 1916, this field had a successful year, facing problems that were in no way conducive toward development work. The locality of this field makes it difficult to get supplies readily,

so that much more work would have been accomplished had supplies for drilling been plentiful. In this field also much land is held up in litigation with the government over withdrawn lands which has kept these properties from being properly developed. There is an optimistic feeling current, however, that the proper bills will be passed in Congress which will open the withdrawn lands for leasing purposes by the original operators, in which case there would be a big increase in development work.

The proven territory in this field was extended during the year when the Pat Welsh gusher was brought in, doing 5,000 barrels a day, which has continued steadily at that rate, to the east of the field. The Standard has also been successful in shutting off the water in its property east of Maricopa, which has long been considered unprofitable on account of water trouble. This will insure a series of wells in this district.

The M. G. & M. M. Oil Company is endeavoring to prove that there are better sands under those that have yielded so abundantly in the past seven years. The test well is now entering the oil sand after having successfully shut off the water, and the formation thus far encountered indicates that the well will be successful. All of these efforts augur for an era of new work that will increase the production during the coming year.

In the Coalinga field production was increased over 1,000,000 barrels during the year, bringing the total to 15,808,912 barrels. Development work in general was increased during the year, which is responsible for the increased production as well as the success attained in deepening old wells.

The Kern River field production remained approximately the same during 1917 that was producing during 1916, being 8,593,034 barrels, as compared to 8,539,973. The keeping of the production to normal was not so much due to development activities as to the extreme durability of the sand.

McKittrick increased its number of producing wells from 278 on January 1 to 295 on December 31, which enabled it to maintain a production totaling 3,275,529 barrels during the year, as compared to 3,347,166 during 1916. This is one of the oldest fields in the State, but new life has been recently added by successes attained by the Standard Oil Company along the north McKittrick front. Here the Standard has drilled several wells, the last of which has borne fruit. There is a fair chance of a new field being formed.

The Lost Hills-Belridge field, a comparatively new one, increased its producing wells during the twelve-month period by 126 wells, thereby increasing its production from 4,873,501 barrels in 1916 to 6,359,421 barrels in 1917.

Coast Section.

The Santa Maria-Lompoc fields came back during 1917 and increased their production from 4,370,055 barrels in 1916 to 3,883,432 in 1917. For several years this field was considered down and out, when it was discovered by the Union that by deepening the wells fifty feet or so increased the production by some 200 barrels daily in a majority of their wells in the old field. It was found that the oil sand in places was about 1,000 feet in thickness, which assures the life of the field for many years.

The Casmalia field was exploited strenuously during 1917 by the Doheny interests, Associated, Shell and Union Oil companies. The oil sand in this locality is found at a shallow depth, and although the gravity is only between 10 and 12 degrees yet the oil is extracted from the ground with ease, due to the heat at which it comes from the earth. Wells on an average produce between 150 and 200 barrels and are found at a 1,500-foot depth. The Doheny interests are drilling on their seventeenth starting during 1917. The increase in production for this field is due more to Casmalia than any other factor.

Summerland continues to maintain a normal production with little depreciation.

Southern Section.

The southern section, of which the Fullerton-Whittier field is the most active, has shown a great record during 1917. These fields increased their production more than any other section of the State, although the proven acreage is comparatively small, and showed a total of 17,932,733 barrels, as compared to 14,400,470 produced during 1916. Producing wells on January 1 were 647, while on December 31 there were 712 in number.

The Standard and the Union oil companies are the leading factors in this field and each have a monthly payroll of approximately $40,000. The sum total of the smaller companies is but $40,000.

Oil is piped from the fields direct to San Pedro, El Segundo and Los Angeles. There are 5,000 acres of proven oil lands. During the year the Standard brought in several large producers on the Murphy and Emery properties. The year 1918 holds out much promise for even more active development work, for supplies are more easily obtained in this field than any other in the State.

The Montebello field, which is located between the old Salt Lake field and the Whittier field, has been the scene of more intense drilling than any other field of the State. In March the Standard brought in the first well of the field, and now twelve companies are operating. Two 8,000-barrel gushers have been obtained and two sands have been discovered. The new year holds forth much for this field.

The Ventura County Newhall showed a slight increase in production during the year, although little new work was pushed during the year. The total was 1,136,917 barrels.

The Los Angeles-Salt Lake field declined in producing wells, as well as production figures.

Following is the daily average by field:—

Production and Producing Wells in Each Field.

Midway-Sunset.

Month.	Prod. wells.	1917.	1916.
January	1,594	3,157,995	3,040,908
February	1,639	2,862,414	2,879,698
March	1,675	3,130,249	3,313,424
April	1,691	3,003,959	3,221,445
May	1,751	3,147,955	3,348,068
June	1,767	3,023,098	3,186,107
July	1,803	3,161,857	3,378,436
August	1,868	3,295,314	3,383,326
September	1,861	3,090,762	3,419,719
October	1,900	3,111,116	3,537,483
November	1,911	2,956,639	3,266,926
December	1,929	3,063,077	3,197,331
Totals		37,094,435	39,172,871
1915		39,621,003	

Coalinga.

Month.	Prod. wells.	1917.	1916.
January	945	1,315,145	958,596
February	937	1,182,062	779,297
March	960	1,346,962	1,009,242
April	966	1,408,591	1,102,872
May	986	1,359,819	1,188,604
June	977	1,272,364	1,283,772
July	999	1,322,448	1,355,214
August	1,024	1,338,290	1,366,331
September	1,025	1,305,509	1,320,349
October	1,023	1,330,224	1,375,064
November	1,044	1,323,988	1,211,927
December	1,045	1,394,380	1,343,169
Totals		15,898,912	14,393,437
1915		13,567,380	

Kern River.

Month.	Prod. wells.	1917.	1916.
January	1,642	746,964	722,016
February	1,647	686,093	683,756
March	1,681	758,267	762,411
April	1,697	725,743	706,206
May	1,697	738,542	713,606
June	1,720	700,911	716,571
July	1,735	720,338	704,992
August	1,731	728,982	*15,022
September	1,740	689,745	694,127
October	1,735	704,077	723,206
November	1,743	691,827	693,278
December	1,745	703,605	714,722
Totals		8,593,034	8,539,973
1915		8,094,673	

McKittrick.

Month.	Prod. wells.	1917.	1916.
January	278	290,965	193,161
February	279	255,727	223,651
March	280	289,322	278,835
April	282	282,640	280,198
May	285	285,237	290,262
June	287	279,875	284,393
July	290	277,637	336,758
August	298	276,691	281,803
September	299	264,962	313,566
October	299	253,806	287,566
November	297	257,078	287,869
December	295	261,580	280,104
Totals		3,275,529	3,347,166
1915		3,585,899	

Lost Hills-Belridge.

Month.	Prod. wells.	1917.	1916.
January	359	465,516	349,244
February	365	441,353	343,824
March	381	528,650	391,477
April	396	525,257	373,975
May	399	537,655	389,218
June	414	538,156	374,918
July	427	571,009	403,164
August	445	568,668	447,355
September	457	557,225	429,906
October	459	552,672	458,436
November	467	530,471	455,393
December	485	542,786	456,591
Totals		6,359,421	4,873,501
1915		4,310,476	

Santa Maria-Lompoc.

Month.	Prod. wells.	1917.	1916.
January	259	405,000	336,536
February	262	372,966	336,536
March	271	445,527	365,800
April	273	429,000	352,590
May	275	416,752	354,363
June	281	436,205	362,400
July	288	549,114	385,140
August	295	546,849	379,435
September	302	542,748	354,331
October	312	577,822	371,106
November	319	607,079	385,755
December	324	654,370	380,934
Totals		5,983,432	4,370,055
1915		4,493,575	

Summerland.

Month.	Prod. wells.	1917.	1916.
January	102	4,500	4,500
February	102	4,500	4,500
March	102	4,500	4,500
April	102	4,500	4,500
May	102	4,500	4,500
June	102	4,500	4,500
July	102	4,500	4,500
August	102	4,500	4,500
September	102	4,500	4,500
October	102	4,500	4,500
November	102	4,500	4,500
December	102	4,500	4,500
Totals		54,000	54,000
1915		55,800	

Fullerton-Whittier.

Month.	Prod. wells.	1917.	1916.
January	647	1,470,972	1,088,914
February	665	1,310,125	1,024,466
March	672	1,426,369	1,160,214
April	670	1,389,381	1,106,085
May	674	1,387,155	1,176,055
June	676	1,295,495	1,190,900
July	680	1,332,746	1,263,019
August	685	1,593,413	1,269,470
September	695	1,676,185	1,263,742
October	690	1,671,914	1,285,572
November	704	1,700,233	1,250,975
December	712	1,675,745	1,332,059
Totals		17,932,733	14,409,470
1915		12,874,670	

Ventura County-Newhall.

Month.	Prod. wells.	1917.	1916.
January	438	90,881	92,191
February	459	84,396	86,471
March	464	93,676	90,711
April	453	87,297	89,584
May	452	93,090	93,827
June	446	98,001	94,622
July	467	95,952	94,861
August	470	96,644	89,619
September	453	94,463	85,693
October	441	96,739	88,396
November	438	101,734	88,358
December	437	103,904	92,041
Totals		1,136,917	1,086,285
1915		1,028,106	

Los Angeles-Salt Lake.

Month.	Prod. wells.	1917.	1916.
January	692	134,132	150,718
February	680	125,054	155,130
March	682	127,884	158,467
April	685	133,034	135,116
May	686	113,642	156,681
June	682	122,477	144,953
July	685	121,387	147,223
August	668	112,790	145,102
September	668	118,400	134,766
October	668	114,724	129,558
November	669	111,224	136,466
December	668	118,413	135,521
Totals		1,453,161	1,729,761
1915		2,004,194	

Total Production by Field.

As is shown by the following statistics every field in the State made an increase in the total production with the exception of the Midway-Sunset, McKittrick and Los Angeles-Salt Lake fields. The production in the Midway field was held down by land litigation, and McKittrick and Los Angeles-Salt Lake fields are among the oldest in the State, which explains these decreases.

As far as sections are concerned, grand totals showed an increase in each one during 1917, as compared to 1916. The Valley section, comprising the Midway-Sunset, Kern River, Coalinga, McKittrick and Lost Hills-Belridge fields, showed an increase of approximately 1,000,000 barrels. The coast section, made up of the Santa Maria-Lompoc and Summerland fields, increased its total production by nearly 2,000,000 barrels. The southern section, consisting of the Fullerton-Whittier, Ventura County-Newhall and Los Angeles-Salt Lake fields, showed an increased production of over 3,000,000 barrels.

Following is the summary of production by fields:—

Total Production by Field.

Field.	1917.	1916.	Increase.
Valley—			
Mid.-Sunset..	37,094,435	39,172,871	*2,078,436
Coalinga....	15,898,912	14,393,437	1,505,476
Kern River..	8,593,034	8,539,973	53,061
McKittrick..	3,275,529	3,347,166	*71,637
L. Hills-Belr.	6,349,421	4,873,501	1,485,920
Coast—			
S.M.-Lompoc	5,983,432	4,370,055	1,613,377
Summerland.	54,000	53,500	500
South—			
Full.-Whit...	17,932,733	14,409,470	3,523,263
L.A.-S. Lake.	1,453,161	1,729,761	*276,600
V.C.-Newh..	1,136,917	1,086,285	50,632
Totals	97,781,574	91,976,019	
1916	91,976,019		
Total inc....	5,805,555		

* Decrease.

Daily Average.

Fields.	1917.	1916.	1915.
Valley—			
Midway-Sunset	101,628	107,323	108,554
Coalinga	43,559	39,434	37,171
Kern River	23,543	23,397	22,177
McKittrick	8,974	9,170	9,824
Lost Hills-Belridge	17,423	13,352	11,810
Coast—			
S. Maria-Lompoc	16,393	11,973	12,311
Summerland	148	147	153
South—			
Fullerton-Whittier	49,131	39,478	35,273
Ventura Co.-Newhall	3,115	2,976	2,817
L. Angeles-Salt Lake	3,987	4,739	5,738
Totals	267,895	251,989	245,824

Sectional Summary.

Section.	1917.	1916.	1915.
Valley fields	71,221,331	70,326,948	69,179,431
Coast	6,037,432	4,423,555	4,549,375
South	20,522,811	12,225,516	15,996,970
Totals	97,781,574	91,976,019	89,725,776

FIELD OPERATIONS.

More development work was done in California during 1917 than during any year in the annals of the oil industry. Previous to this year 1916 held the record in all field operations. The record of 1917 resulted from the exceptionally high prices offered for an inducement to expand in drilling, and by an honest effort made on the part of the operators to cut down the monthly shortage which averaged nearly 1,000,000 barrels per month.

Figured by monthly average, the number of wells completed during 1917 were 63, as compared to 52 in 1916, and 28 in 1914. In the number of rigs up the average for the year was 65, against 56 in 1916, and 14 in 1915. On January 1, 1917, there were 312 wells drilling, and on January 1, 1918, this number had been increased to 382, making an average of 361 during the year, as compared to 238 in 1916, and 153 in 1915. Producing wells were increased from 6,956 on the first of the year to 7,742 on the last day of the year, making an average of 7,398 wells producing monthly, nearly 1,000 more than were producing in 1916 or 1915. Fewer wells were abandoned in 1917 than in 1916 or 1915, the monthly average being 14.

Kern River was the only field in the State which showed a decrease in field operations. The Santa Maria field, due to the development around Casmalia, increased the number of drilling wells more during the year than any other field. Here the monthly average for the year was 48, while during 1916 the monthly average was but 14 strings. Coalinga, Fullerton-Whittier and Ventura County-Newhall fields also showed a large increase in all field operations.

Following are given the field operations by fields, with their summaries:—

Midway-Sunset.

Month.	Rigs up.	Wells Comp.	Wells Drill.	Aban.
January	35	32	94	2
February	39	18	104	1
March	50	23	111	2
April	14	29	86	2
May	25	26	98	3
June	27	18	108	..
July	26	28	102	5
August	29	20	111	1
September	31	34	95	..
October	23	25	88	5
November	27	21	98	6
December	15	17	97	5
Average, 1917...	28	25	99	3
Average, 1916....	25	19	68	4

Coalinga.

Month.	Rigs up.	Wells Comp.	Wells Drill.	Aban.
January	8	1	43	1
February	7	5	43	5
March	13	10	51	..
April	5	6	35	3
May	6	10	50	..
June	6	7	49	4
July	6	9	56	..
August	6	8	51	6
September	3	9	51	4
October	3	8	56	2
November	22	12	47	2
December	5	15	44	5
Average, 1917...	9	8	48	3
Average, 1916....	3	3	22	5

Kern River.

Month.	Rigs up.	Wells Comp.	Wells Drill.	Aban.
January	..	5	8	..
February	..	4	5	..
March	..	4	6	..
April	..	3	2	4
May	..	1	3	3
June	..	4	2	1
July	..	3	4	..
August	..	4	2	..
September	..	1	3	..
October	..	3	6	..
November	..	4	5	..
December	..	2	6	..
Average, 1917...	..	3	4	1
Average, 1916....	5	8	15	1

McKittrick.

Month.	Rigs up.	Wells Comp.	Wells Drill.	Aban.
January	6	2	25	..
February	2	2	25	1
March	5	2	24	2
April	1	3	23	2
May	..	4	22	..
June	..	2	22	..
July	..	3	21	..
August	..	4	18	..
September	..	1	19	..
October	1	2	19	1
November	4	..	19	..
December	..	2	18	..
Average, 1917...	2	2	21	..
Average, 1916....	3	3	9	2

Lost Hills-Belridge.

Month.	Rigs up.	Wells Comp.	Wells Drill.	Aban.
January	12	6	25	..
February	8	11	21	..
March	18	19	19	1
April	9	8	24	..
May	18	13	32	5
June	13	12	37	..
July	16	14	39	..
August	11	12	32	..
September	7	7	36	..
October	11	15	19	..
November	2	9	23	..
December	4	4	27	..
Average, 1917...	11	11	28	1
Average, 1916....	13	13	22	1

Santa Maria-Lompoc.

Month.	Rigs up.	Wells Comp.	Wells Drill.	Aban.
January	5	5	30	..
February	13	5	41	1
March	6	2	48	..
April	9	3	50	1
May	8	4	54	2
June	2	6	54	1
July	6	5	51	1
August	3	7	49	2
September	5	11	45	1
October	2	10	45	..
November	2	6	53	2
December	7	6	51	2
Average, 1917...	6	6	48	1
Average, 1916....	2	1	14	1

Fullerton-Whittier.

Month.	Rigs up.	Wells Comp.	Wells Drill.	Aban.
January	4	4	58	1
February	3	6	57	2
March	7	1	68	..
April	6	5	60	3
May	5	5	62	2
June	5	5	68	2
July	7	3	74	..
August	6	6	77	1
September	13	9	78	1
October	7	4	82	1
November	9	7	86	6
December	10	4	91	1
Average, 1917...	7	5	72	2
Average, 1916....	6	6	60	2

Ventura County-Newhall.

Month.	Rigs up.	Wells Comp.	Wells Drill.	Aban.
January	9	2	26	3
February	3	4	31	1
March	3	1	34	..
April	1	1	33	1
May	3	5	31	3
June	2	5	30	1
July	4	1	34	..
August	6	1	41	1
September	4	4	42	9
October	4	..	47	1
November	3	1	48	..
December	2	..	46	1
Average, 1917...	4	2	37	2
Average, 1916....	2	1	26	2

Lost Angeles-Salt Lake.

Month.	Rigs up.	Wells Comp.	Wells Drill.	Aban.
January	1	..	3	..
February	1	..	1	5
March	..	..	3	..
April	..	..	3	..
May	..	..	3	..
June	..	..	3	..
July	..	..	3	..
August	..	..	3	18
September	..	..	3	..
October	..	..	3	..
November	..	..	2	..
December	..	..	2	..
Average, 1917...	..	..	3	2
Average, 1916....	..	..	1	1

Summary of Field Operations.

Month.	Rigs up.	Wells Comp.	Wells Drill.	Prod.	Aban.
January ...	80	57	312	6,956	7
February ..	76	55	326	7,035	17
March	102	62	364	7,168	4
April	45	68	342	7,215	16
May	65	68	365	7,307	14
June	55	59	376	7,352	12
July	65	66	381	7,476	6
August	61	62	384	7,586	29
September..	63	76	372	7,602	15
October ...	51	67	362	7,638	10
November..	69	80	381	7,694	16
December...	43	50	382	7,742	16
Av. 1917..	65	63	361	7,398	14
Aver. 1916.	56	52	238	6,542	18
Aver. 1915.	14	28	153	6,016	15
Aver. 1914.	19	37	222	5,867	11

STOCKS.

Stocks at the close of the year totaled 32,656,966 barrels, as against 43,640,294 barrels on the first of the year, indicating a reduction of 10,983,298 barrels, a daily average of 30,091. This record compares with the total withdrawals during the year 1916 of 12,336,886 barrels, or a daily average of 33,800, as indicating a total decrease of 1,353,588 barrels, or a daily average decrease of 3,709.

A good indication was shown that, should the present increase in production continue, a converging of the production and consumption figures might be looked for during 1918, by the fact that December showed the least draft upon stocks of any month during the year. January's withdrawal from storage totaled 1,405,792 barrels, the highest total for the year.

Following is the stock report:—

Range of Stocks.

1917.	Total barrels.	Total decrease.
January 1	43,640,294	.....
January	42,234,502	1,405,792
February	40,867,931	1,366,571
March	39,655,875	1,212,056
April	38,825,430	830,445
May	37,842,544	982,886
June	36,510,748	1,331,796
July	36,135,864	374,884
August	35,367,742	768,122
September	34,800,198	567,544
October	33,762,500	1,037,698
November	32,812,763	949,737
December	32,656,996	155,767
Total decrease, 1917....		10,983,298
Total decrease, 1916.....		12,336,886
Total decrease, 1915.....		2,281,939

Production and Value.

Although authentic figures on the value of the oil produced during 1917 are not yet available, the average price of oil throughout the year at the wells in all the fields was little under $1 a barrel. During 1916 the average value of the oil produced in California was 63.6 cents per barrel, and the total value of the stated value was $57,421,334. Figuring the value of 1917's production at 90 cents per barrel, the total value would be $88,003,417.

Production and Value Since 1900.

Year.	Production.	Value.
1900	4,324,484	$4,076,975
1901	8,786,330	4,974,540
1902	13,984,268	4,873,617
1903	24,382,472	7,399,349
1904	29,649,434	8,265,434
1905	33,427,473	8,201,846
1906	33,098,598	9,553,430
1907	39,748,375	14,699,956
1908	44,854,373	23,433,502
1909	55,471,601	30,756,713
1910	73,910,560	35,749,173
1911	81,134,391	38,719,080
1912	87,372,593	39,624,501
1913	97,788,525	45,709,400
1914	102,871,907	46,292,358
1915	89,725,776	41,273,856
1916	91,976,019	57,421,334
1917	97,781,574	88,003,417

NEW PRODUCTION

The total new production from wells brought in during 1917 totaled 128,270 barrels, an increase over 1916's total of 90,984 barrels of 37,286.

Month.	1917.	1916.	1915.
January	6,150	4,395	6,246
February	6,655	8,795	5,190
March	8,530	6,790	5,700
April	11,380	5,555	4,170
May	7,145	3,651	11,300
June	7,880	15,835	2,870
July	15,195	9,380	6,307
August	22,755	7,168	7,870
September	12,595	8,810	17,912
October	15,135	7,425	4,220
November	7,660	5,800	3,375
December	7,190	7,400	5,500
Totals	128,270	90,984	80,750
1916	90,984		
Increase	37,286		

Market Advances.

During 1917 the Standard Oil Company advanced the prices of crude petroleum at the wells on three different occasions, the total advance from January 1, 1917, to January 1, 1918, being 25 cents. The first advance of 5 cents per barrel came on May 14, following in quick succession by advances of 10 cents per barrel on June 12 and July 18.

Following is given the prices offered by the Standard Oil Company on January 1, 1917, and January 1, 1918:—

Standard Oil Prices, Opening and Closing.

	Jan. 1, 1917. Per bbl.	Jan. 1, 1918. Per bbl.
SAN JOAQUIN VALLEY FIELDS. (Kern River, Midway-Sunset, McKittrick, Lost Hills-Belridge, Coalinga.)		
14 deg., to and including 17.9 deg. gravity	$0.73	$0.98
18 deg., to and including 18.9 deg. gravity	.74	.99
And for each increase in gravity of one full degree above 18.0 deg. gravity, up to and inclusive of 24.9 deg. gravity, 1 cent per barrel additional, 25 deg., to and including 25.9 deg. gravity	.82	1.07
And for each increase in gravity of one full degree above 25.0 deg. gravity, up to and inclusive of 36.9 deg. gravity, 2 cents per barrel additional.		
37 deg., to and including 37.9 deg. gravity	1.07	1.32
And for each increase in gravity of one full degree above 37.0 deg. gravity, three cents per barrel additional.		
VENTURA COUNTY.		
25 deg., to and including 25.9 deg. gravity	.82	1.07
And for each increase in gravity of one full deg. above 25.0 deg. gravity, up to and inclusive of 36.9 deg. gravity, two cents per barrel additional.		
37 deg., to and including 37.9 deg. gravity	1.07	1.32
And for each increase in gravity of one full degree above 37.0 deg. gravity, three cents per barrel additional.		
WHITTIER-FULLERTON AND SANTA MARIA.		
16 deg., to and including 17.9 deg. gravity	.73	.98
18 deg., to and including 18.9 deg. gravity	.74	.99
And for each increase in gravity of one full degree above 18.0 deg. gravity, up to and inclusive of 24.9 deg. gravity, one cent per barrel additional.		
25 deg., to and including 25.9 deg. gravity	.82	1.07
And for each increase in gravity of one full degree above 25.0 deg. gravity up to and inclusive of 36.9 deg. gravity, two cents per barrel additional.		
37 deg., to and including 37.9 deg. gravity	1.07	1.32
And for each increase in gravity of one full degree above 37.0 deg. gravity, three cents per barrel additional.		

Standard's Statistics, 1917.

The Standard Oil Bulletin gives the following data as to the production and consumption of crude oil during the year 1917:—

California's total production of crude oil in 1917 was 97,267,832 barrels, an increase of 5,445,470 barrels over 1916. However, this production was 11,585,725 barrels less than the market requirements, as represented by shipments.

This discrepancy was the amount of stock decrease for the year.

Field.	Rigs Completed.	Wells—Completed.	Wells—Abandoned.	Production—For year.	Production—Per day.
Kern Rive.r.	27	40	3	8,495,610	23,276
McKittrick...	31	26	1	3,252,544	8,911
Midway-Sunset	314	282	19	36,560,145	100,165
Lost Hills-Belridge	163	132	4	6,295,320	17,247
Coalinga	142	114	30	15,938,543	43,667
Lompoc-Santa Maria...	102	63	5	5,798,076	15,885
Ventura Co. Newhall...	47	22	9	1,186,407	3,250
Los Angeles-Salt Lake..	2	1	10	1,501,799	4,115
Whittier-Fullerton	95	56	11	18,155,440	49,741
Summerland.	..	..	..	56,570	155
Watsonville..	..	..	..	27,375	75
Total	923	736	92	97,267,832	266,487

Total crude oil stocks, December 31, 1916, 44,036,190 barrels.

Total crude oil stocks, December 31, 1917, 32,450,465 barrels.

Decrease during year, 11,585,725 barrels.

Daily decrease during year, 31,742 barrels.

PIPELINES AND REFINERIES ON RECORD ON SEPTEMBER 30, 1917, NAME AND LOCATION

The total number of pipelines and refineries, including mileage and capacity of pipelines, also capacity of the refineries and by whom owned is given in the following list:—

East Coast District.

Atlantic Refining Co.	Point Breeze, Pa.
Interocean Oil Co.	Baltimore, Md.
Manufacturers' Paraff. Co.	Chester, Pa.
Prudential Oil Corp.	Fairfield, Md
Pure Oil Co.	Marcus Hook, Pa.
Standard Oil Co. (N. J.)	Baltimore, Md.
Standard Oil Co. (N. J.)	Rahway, N. J.
Standard Oil Co. (N. J.)	Bayonne, N. J.
Standard Oil Co. (N. J.)	Jersey City, N. J.
Sunlight Oil & Gasoline Co.	Philadelphia, Pa.
Tide Water Oil Co.	Bayonne, N. J.
U. S. Asphalt Ref. Co.	Baltimore, Md.
Vacuum Oil Co.	Paulsboro, N. J.
Sun Co.	Marcus Hook, N.J.

Total daily capacity of district (in barrels of 42 gallons), 153,725.

Oil is obtained from Appalachian, Mid-Continent, Mexico, Illinois and Texas.

Pennsylvania, New York, Eastern Ohio and West Virginia.

Amber Oil Co.	Stoneham, Pa.
American Oil Works	Titusville, Pa.
Atlantic Refining Co.	Franklin, Pa.
Atlantic Refining Co.	Pittsburgh, Pa.
Beaver Ref. Co.	Washington, Pa.
Butler County Ref. Co.	Bruin, Pa.
Canfield Oil Co.	Coraopolis, Pa.
Canfield Oil Co.	Cleveland, Ohio.
Clarendon Ref. Co.	Clarendon, Pa.
Conewango Ref. Co.	Warren, Pa.
Continental Ref. Co.	Oil City, Pa.
Cornplanter Ref. Co.	Warren, Pa.
Crew Levick Co.	Titusville, Pa.
Crew Levick Co.	Titusville, Pa.
Crew Levick Co.	Warren, Pa.
Crystal Oil Works	Rouseville, Pa.
W. H. Daugherty & Son Ref. Co.	Petrolia, Pa.
Elk Ref. Co.	Falling Rock, W. Va.
Emery Manufacturing Co.	Bradford, Pa.
Emlenton Refining Co.	Emlenton, Pa.
Empire Oil Works	Reno, Pa.
Freedom Oil Works	Freedom, Pa.
Independent Ref. Co.	Oil City, Pa.
Island Petroleum Co.	Neville Island, Pa.
Kendall Ref. Co.	Bradford, Pa.
A. D. Miller's Sons Co.	Pittsburgh, Pa.
Mutual Ref. Co.	Warren, Pa.
National Ref. Co.	Findlay, Ohio.
Ohio Cities Gas Co.	Charleston, W. Va.
Ohio Valley Ref. Co.	St. Marys, W. Va.
Penn-American Ref. Co.	Rouseville, Pa.
Penn Oil Products Ref. Co.	Eldred, Pa.
Penn Ref. Co.	Karns City, Pa.
Petrolia Ref. Co.	Petrolia, Pa.
Pittsburgh Oil Ref. Co.	Coraopolis, Pa.
Seneca Oil Works	Warren, Pa.
L. Smith Ref. Co.	Clarendon, Pa.
Standard Oil Co. (N. Y.)	Buffalo, N. Y.
Standard Oil Co. (Ohio)	Cleveland, Ohio.
Standard Oil Co. (N. J.)	Parkersburg, W. Va.
Starlight Ref. Co.	Karns City, Pa.
Sterling Oil Works	Marietta, Ohio.
Superior Oil Works	Warren, Pa.
Tiona Ref. Co.	Clarendon, Pa.
Titusville Oil Works	Titusville, Pa.
United Ref. Co.	Warren, Pa.
Vacuum Oil Co.	Olean, N. Y.
Valvoline Oil Works	East Butler, Pa.
Vulcan Oil Ref. Co.	Coraopolis, Pa.
Warner-Quinlan Asphalt Co.	Cairo, W. Va.
Warren Ref. Co.	Warren, Pa.
Waverly Oil Works	Pittsburgh, Pa.
Wellsville Ref. Co.	Wellsville, N. Y.
Wilburine Oil Works	Warren, Pa.

Total daily capacity of district (in barrels of 42 gallons), 67,625.

Oil is obtained from Pennsylvania, Illinois, Mid-Continent and Lima.

Western Ohio, Indiana, Illinois and Kentucky.

Central Ref. Co.	Lawrenceville, Ill.
Craig Oil Ref. Co.	Ironville, Ohio.
General Ref. & Prod. Co.	Nashville, Tenn.
Indian Ref. Co.	Lawrenceville, Ill.
Leader Oil Co.	Casey, Ill.
New Process Ref. Co.	Joliet, Ill.
Paragon Ref. Co.	Toledo, Ohio.
Solar Ref. Co.	Lima, Ohio.
Standard Oil Co. (Ind.)	Whiting, Ind.
Standard Oil Co. (Ind.)	Wood River, Ill.
Sun Co.	Toledo, Ohio.
Texas Co.	Lockport, Ill.
Wabash Ref. Co.	Robinson, Ill.
Middle West Ref. Co.	Columbus, Ohio.

Total daily capacity of district (in barrels of 42 gallons), 72,100.

Oil is obtained from Illinois, Ohio, Kentucky, Indiana and Mid-Continent.

Oklahoma and Kansas.

Ames Ref. Co.	Cushing, Okla.
Atwood Ref. Co.	Oklahoma City, Okla
Benedum-Trees Oil Co.	Boynton, Okla.
Canfield Ref. Co.	Yale, Okla.
Champlain Ref. Co.	Enid, Okla.
Cities Service Co.	Independence, Kan.
Commonwealth Oil & Ref. Co.	Moran, Kan.
Consolidated Oil & Ref Co.	Cleveland, Okla.
Consolidated Oil & Ref. Co.	E. St. Louis, Mo.
Constantin Ref. Co.	West Tulsa, Okla.
Consumers Ref. Co.	Cushing, Okla.
Continental Ref. Co.	Bristow, Okla.
Cosden & Co.	West Tulsa, Okla.
Cosden & Co.	Bigheart, Okla.
Crescent Ref. Co.	New Kirk, Okla.
Crystal White Ref. Co.	Allen, Okla.
Cushing Pet. Products Co.	Cushing, Okla.
El Dorado Ref. Co	El Dorado, Kan.
Empire Ref. Co.	Cushing, Okla.
Empire Ref. Co.	Cushing, Okla.
Empire Ref. Co.	Okmulgee, Okla.
Empire Ref. Co.	Ponca City, Okla.
Empire Ref. Co.	Oklahoma City, Okla
General Ref. Co.	Kansas City, Kan.
Golden Rule Ref. Co.	Wichita, Kan.
Great American Ref. Co.	Jennings, Okla.
Great Western Oil Ref. Co.	Erie, Kan.
Hillman Ref. Co.	Cushing, Okla.
Hutchinson Ref. Co.	Hutchinson, Kan.
Illinois Oil Co.	Cushing, Okla.
Imperial Ref. Co.	Tulsa, Okla.
Indiahoma Ref. Co.	E. St. Louis, Ill.
Indiahoma Ref. Co.	Okmulgee, Okla.
Inland Ref. Co.	Cushing, Okla.
Interstate Ref. Co.	Yale, Okla.
Kanotex Ref. Co.	Caney, Kan.
Kansas City Ref. Co.	Kansas City, Kan.
Kansas Cooperative Ref. Co.	Chanute, Kan.
Kansas Oil Ref. Co.	Coffeyville, Kan.
Lake Park Ref. Co.	Okmulgee, Okla.
Lawton Ref. Co.	Lawton, Okla.
Lesh Ref. Co.	Arkansas City, Kan.
Mid-Co Gas Co.	West Tulsa, Okla.
Midland Ref. Co.	El Dorado, Kan.
Miller Petroleum Ref. Co.	Humble, Kan.
Muskogee Ref. Co.	Muskogee, Okla.
National Ref. Co.	Coffeyville, Kan.
North American Ref. Co.	Pemeta, Okla.
North American Ref. Co. of Kansas	Rosedale, Kan.
North American Ref. Co. of Missouri	Kansas City, Mo.
O. K. Ref. Co.	Niotaze, Kan.
Ohio Cities Gas Co.	Ardmore, Okla.
Ohio Cities Gas Co.	Cushing, Okla.
Oilton Ref. Co.	Oilton, Okla.
Okmulgee Prod. & Ref. Co.	Okmulgee, Okla.
Oneta Ref. Co.	Oneta, Okla.
Ozark Ref. Co.	Fort Smith, Ark.
Pan-American Ref. Co.	West Tulsa, Okla.
Pawnee Oil Ref. Co.	Yale, Okla.
Petrol Ref. Co.	Yale, Okla.
Phoenix Ref. Co.	Sand Springs, Okla.
Pierce Oil Corporation	Sand Springs, Okla.
Perfection Ref. Co.	Cushing, Okla.
Producers & Ref. Corp.	Blackwell, Okla.
Riverside Fuel & Oil Co.	Oilton, Okla.
Roxana Petroleum Co.	Cushing, Okla.
St. Joseph Viscosity Oil Co	St. Joseph, Mo.
Sapulpa Ref. Co.	Sapulpa, Okla.
Sinclair Ref. Co.	Argentine, Mo.
Sinclair Ref. Co.	Chanute, Kan.
Sinclair Ref. Co.	Coffeyville, Kan.
Sinclair Ref. Co.	Cushing, Okla.
Sinclair Ref. Co.	Muskogee, Okla.
Sinclair Ref. Co.	Vinita, Okla.
Southern Oil Corp.	Yale, Okla.
Standard Oil Co. (Kan.)	Neodesha, Kan.
Standard Oil Co. (Ind.)	Sugar Creek, Mo.
Sun Oil Co.	Yale, Okla.
Texas Co.	Tulsa, Okla.
Uncle Sam Oil Co.	Cherryvale, Kan.
Walnut River Ref. Co.	Augusta, Kan.
Western Ref. Co.	Wichita, Kan.
White Eagle Pet. Co.	Augusta, Kan.
Wichita Ind. Consol. Co.	Wichita, Kan.
Wilhoit Ref. Co.	Joplin, Mo.
Yale Oil Corporation	Yale, Okla.

Total daily capacity of district (in barrels of 42 gallons), 241,775.

Oil is obtained from Oklahoma and Kansas.

Texas and Louisiana.

American Oil Ref. Co.	Freeport, La.
Avis Ref. Co.	Jacksboro, Tex.
Caddo Oil & Ref. Co.	Freeport, La.
Empire Ref., Inc.	Gainsville, Tex.
Freeport-Mexican Fuel Oil Corporation	New Orleans, La.
Gulf Ref. Co.	Port Arthur, Tex.
Gulf Ref. Co.	Fort Worth, Tex.
Humble Oil & Ref. Co.	Humble, Tex.
Humble Oil & Ref. Co.	San Antonio, Tex.
Liberty Oil Co.	New Orleans, La.
Louisiana Oil Ref. Corp.	Gas Center, La.
Magnolia Petroleum Co.	Fort Worth, Tex.
Magnolia Petroleum Co.	Corsicana, Tex.
Magnolia Petroleum Co.	Beaumont, Tex.
Mexican Petroleum Co.	Destrehan, La.
Oriental Oil Co.	Oriental, Tex.
Panhandle Ref. Co.	Wichita Falls, Tex.
Pelican Oil Ref. Co.	Chalmette, La.
Petroleum Ref. Co.	Galena, Tex.
Pierce Fordyce Oil Assn.	Texas City, Tex.
Pierce Fordyce Oil Assn.	N. Fort Worth, Tex.
Texas Co.	Port Arthur, Tex.
Texas Co.	Port Neches, Tex.
Texas Co.	Gates, Tex.
Thrall Oil Ref. Co.	Thrall, Tex.
Wichita Valley Ref. Co.	Iowa Park, Tex.
Standard Oil Co.	Baton Rouge, La.

Total daily capacity of district (in barrels of 42 gallons), 245,715.

Oil is obtained from Texas, Louisiana, Oklahoma and Mexico.

Rocky Mountain District.

Amer. Oil Processes, Ltd.	Loomis, Col.
Midwest Ref. Co.	Casper, Wyo.
Midwest Ref. Co.	Greybull, Wyo.
Northwestern Oil Ref. Co.	Crowley, Wyo.
Standard Oil Co. (Ind.)	Casper, Wyo.
United Oil Co.	Florence, Col.
Utah Oil Ref. Co.	Salt Lake C., Utah

Total daily capacity of district (in barrels of 42 gallons), 33,800.

Oil is obtained from Wyoming, Oklahoma and Colorado.

California.

Amalgamated Oil Co.	Los Angeles, Cal.*
American Oilfields Co.	Fellows, Cal.*
American Petroleum Co.	Coalinga, Cal.*
Asphaltum & Oil Ref. Co.	Los Angeles, Cal.
Associated Oil Co.	Avon, Cal.
Associated Oil Co.	Gaviota, Cal.
California-Fresno Oil Co.	Fresno, Cal.
Cal. Oil & Asphalt Co.	Los Angeles, Cal.
Capitol Crude Oil Co.	Santa Paula, Cal.
Fairchild-Gilmore - Wilton Co.	Los Angeles, Cal.
General Petroleum Co.	Vernon, Cal.*
Golden State Oil Co.	Los Angeles, Cal.
Jordan Oil Co.	Los Angeles, Cal.
King Ref. Co.	Kern River, Cal.
Pioneer Paper Co.	Vernon, Cal.
Producers' Ref. Co.	Kern River, Cal.
Puente Oil Co.	Chino, Cal.
Richfield Oil Co.	Bakersfield, Cal.
Richfield Oil Co.	Los Angeles, Cal.
St. Helens Petroleum Co.	Fullerton, Cal.*
C. L. Seager	Tulare, Cal.
The Shell Co. of California	Coalinga, Cal.
The Shell Co. of California	Martinez, Cal.
Standard Oil Co. (Cal.)	Bakersfield, Cal.
Standard Oil Co. (Cal.)	El Segundo, Cal.
Standard Oil Co. (Cal.)	Richmond, Cal.
Turner Oil Co.	Avila, Cal.*
Union Oil Co.	Los Angeles, Cal.

* Topping plants.

Union Oil Co.	Betteravia, Cal.
Union Oil Co.	Brea, Cal.
Union Oil Co.	Maricopa, Cal.
Union Oil Co.	Oleum, Cal.
Union Oil Co.	Santa Paula, Cal.
Ventura Ref. Co.	Fillmore, Cal.
Vernon Oil Ref. Co.	Vernon, Cal.
Wilshire Oil Co.	Los Angeles, Cal.

Total daily capacity of district (in barrels of 42 gallons), 282,310.

Oil is obtained from California.

Total daily capacity of United States refineries (in barrels of 42 gallons), 1,087,050.

List of the Principal Pipelines in the United States, Their Approximate Mileage and Capacities.

Pipeline.	Approximate mileage trunk lines and laterals.	From—	To—	Trunk line capacity. Bbbls., daily.
Alluwe Pipeline Co.	40	Alluwe district, Okla.	Coffeyville, Kan.	2,500
Amalgamated Oil Co.	7	Salt Lake district, Cal.	Los Angeles, Cal.	9,000
Associated Oil Co.	105	Coalinga district, Cal.	Monterey, Cal.	15,000
Associated Oil Co.	60	Santa Barbara county, Cal.	Gaviota, Cal.	23,000
Associated Pipeline Co.	281	Kern River district, Cal.	Port Costa, Cal.	13,000
Associated Pipeline Co.	278	Sunset district, Cal.	Port Costa, Cal.	26,000
Buckeye Pipeline Co.— Lima division	1700	Ohio-Indiana State boundary.	Ohio - Pennsylvania State boundary	175,000
Macksburg division	1350	Eastern Ohio.	Ohio - Pennsylvania and Ohio-West Virginia boundary	210,000
Corden & Co.	...	Adjacent wells.	Bigheart, Okla.	1500
Cosden Pipeline Co.	...	Various Oklahoma oil districts	West Tulsa, Okla.	30,000
Crescent Pipeline Co.	315	Greggs, Pa.	Marcus Hook, Pa.	25,600
Cumberland Pipeline Co.	475	Southeastern Kentucky.	Kentucky-West Virginia boundary	210,000
Emery Pipeline Co.	1480	Adjacent oil districts.	Bradford, Pa.	21,000
Empire Pipeline Co.	85	Eldorado and Augusta, Kan.	Ponca City, Okla.	35,000
Empire Pipeline Co.	67	Ponca City, Okla.	Norfolk, Okla.	
Empire Pipeline Co.	70	Northern Oklahoma.	Independence, Kan.	
Empire Pipeline Co.	85	Healdton, Okla.	Gainesville, Tex.	
Eureka Pipeline Co.	14,500	Kentucky-West Virginia boundary and Ohio-West Virginia boundary.	West Virginia-Pennsylvania boundary.	65,000
Franklin Pipe Co.	Short	Adjacent fields.	Franklin, Pa.	2150
General Pipeline Co.	156	Midway district, Cal.	Los Angeles, Cal.	25,000
General Pipeline Co.	52	Liebere, Cal.	Mojave, Cal.	.....
Gulf Pipeline Co.	458	Texas-Oklahoma State line.	Port Arthur, Tex.	28,000
Gulf Pipeline Co.	76	Batson, Tex.	Sour Lake and Houston, Tex.	5,000-14,000
Gulf Pipeline Co.	117	Louisiana-Texas State line.	Lufkin Station, Tex.	4,000-9,600
Gulf Pipeline Co.	124	Saltillo Station, Tex.	Fort Worth, Tex.	7,000
Gulf Pipeline Co. of Oklahoma	275	Bartlesville, Okla.	Oklahoma - Texas boundary	8,000-25,000
Gulf Refining Co. of Louisiana	21	Mansfield, La.	Louisiana - Texas boundary	10,000
Illinois Pipeline Co.	1,300	Alton, Ill.	Centerbridge, Pa.	260,000
Illinois Pipeline Co.	25	Grass Creek, Wyo.	Chatham, Wyo.	
Illinois Pipeline Co.	15	Elk Basin, Wyo.	Frannie, Wyo.	220,000
Illinois Pipeline Co.	20	Big Muddy, Wyo.	Casper, Wyo.	
Indiana Pipeline Co.	1800	Griffith, Ind.	Indiana-Ohio boundary	2110,000
Magnolia Petroleum Co.	560	Electra, Tex.	Sabine, Tex.	215,000-60,000
Magnolia Petroleum Co.	137	Healdton, Okla.	Fort Worth, Tex.	215,000-60,000
Magnolia Petroleum Co.	1150	Cushing district, Okla.	Addington, Okla.	250,000
Midwest Refining Co.	190	Salt Creek district, Wyo.	Casper, Wyo.	213,000
National Pipeline Co.	160	Oil fields in Wood county, Ohio	Findlay, Ohio.	21,000
National Pipeline Co.	1110	Oil fields in Southeastern Ohio	Marietta, Ohio.	2500
National Transit Co.	205	Nedska, Pa.	New York - Pennsylvania boundary.	
National Transit Co.	175	Colegrove, Pa.	Milway, Pa.	
National Transit Co.	35	Milway, Pa.	Fawn Grove, Pa.	275,000
National Transit Co.	70	Milway, Pa.	Point Breeze, Pa.	
National Transit Co.	70	Milway, Pa.	Centerbridge, Pa.	
New York Transit Co.	130	Pennsylvania-New York boundary	Buffalo, N. Y.	
New York Transit Co.	1,100	Olean, N. Y.	Bayonne, N. J., and Long Island, N. Y.	255,000
Northern Pipe Co.	525	Pennsylvania-Ohio boundary.	Pennsylvania - New York boundary.	260,000
Oklahoma Pipeline Co.	229	Creek county, Okla.	McCurtain, Okla.	35,000
Paragon Refining Co.	1237	Sandusky county, Ohio.	Toledo, Ohio	4,000
Prairie Pipeline Co.	701	Cushing district, Okla.	Humboldt, Kan.	20,000-160,000
Prairie Pipeline Co.	1,820	Humboldt, Kan.	Sugar Creek, Mo., & Wood River, Ill.	94,000-25,000
Prairie Pipeline Co.	90	McCurtain, Okla.	Ida, La.	31,000
Prairie Pipeline Co.	55	Eldorado and Augusta, Kan.	Neodesha, Kan.	.....
Producers and Refiners' Pipeline Co.	210	Watertown, Ohio.	Titusville, Pa.	20,000
Producers' Transportation Co.	41	Coalinga district, Cal.	Junction, Cal.	15,000
Producers' Transportation Co.	50	Sunset district, Cal.	Junction, Cal.	20,000
Producers' Transportation Co.	39	Kern River district, Cal.	McKittrick, Cal.	.....
Producers' Transportation Co.	13	Lost Hills district, Cal.	Trunk Line, Cal.	.....
Producers' Transportation Co.	3	Belridge district, Cal.	Trunk Line, Cal.	.....
Producers' Transportation Co.	74	Junction, Cal.	Port San Luis, Cal.	30,000
Pure Oil Pipeline Co.	250	Morgantown, W. Va.	Marcus Hook, Pa.	210,000

Rio Bravo Oil Co.	13	Saratoga, Tex.	Sour Lake, Tex.	[1]1,500
Sinclair-Cudahy Pipeline Co.	650	Cushing district, Okla.	Kansas City and Chicago	
Sinclair-Cudahy Pipeline Co.	70	Cushing district, Okla.	Coffeyville, Kan.	[1]50,000
Sinclair-Cudahy Pipeline Co.	300	Branches and laterals in Oklahoma and Kansas.		
Southern Pipeline Co.	1,130	Pennsylvania-West Virginia boundary	Philadelphia, Pa.	[1]51,000
Southwestern Pennsylvania Pipelines	1,650	Operates exclusively in Southwestern Pennsylvania		[1]45,000
Standard Oil Co. (Cal.)	281	Kern River district, Cal.	Richmond, Cal.	65,000
Standard Oil Co. (Cal.)	32	Midway district, Cal.	Bakersfield, Cal.	65,000
Standard Oil Co. (Cal.)	29	Coalinga district, Cal.	Mendota, Cal.	28,000
Standard Oil Co. (Cal.)	21	Lost Hills district, Cal.	Pond, Cal.	20,000
Standard Oil Co. (Cal.)	24	Northan district, Cal.	El Segundo, Cal.	27,000
Standard Oil Co. (Cal.)	45	Newhall district, Cal.	Ventura, Cal.	1,400
Standard Oil Co. (Cal.)	32	Santa Mina district, Cal.	Port Hartford, Cal.	20.000
Standard Oil Co. of La.	522	Ida, La.	Baton Rouge, La.	35,000
Sun Co.	[1]250	Seneca and Wood counties, Ohio	Toledo, Ohio.	[1]1,000
Sun Pipeline Co.	[1]100	Humble, Tex.	Sabine Pass, Tex.	[1]21,000
Texas Co. (main lines)	742	Bartlesville, Okla.	Port Arthur, Tex.	10,000-20,000
Texas Co. (main lines)	160	Electra, Tex.	West Dallas, Tex.	12,000-17,000
Texas Co. (main lines)	253	Vivian, La.	Port Arthur, Tex.	16,000-20,000
Texas Co. (main lines)	96	Evangeline, Tex.	Garrison, Tex.	9,600
Texas Co. (main lines)	60	Healdton, Okla.	Sherman, Tex.	12,000
Texas Co. (laterals)	222	In Oklahoma and Texas.		.....
Tidewater Pipe Co. (main line)	830	Stoy, Ill.	Bayonne, N. J.	[1]11,000
Tidewater Pipe Co. (laterals)	1,929	In Pennsylvania, New York, Illinois and Indiana		.....
Union Oil Co.	65	Orcutt, Cal.	Port San Luis, Cal.	.....
Union Oil Co.	43	Local lines in Ventura County, Cal.		.....
Union Oil Co.	51	Local lines in Los Angeles, Orange county fields, Cal.		.....
Valley Pipeline Co.	170	Coalinga district, Cal.	San Francisco Bay.	25,000
Wilburine Pipeline Co.	125	Shannopin, Pa.	Warren, Pa.	[2]5,000
Yarhola Pipeline Co.	135	Healdton, Okla.	Cushing, Okla.	[2]9,000
Yarhola Pipeline Co. (under construction).	400	Cushing, Okla.	St. Louis, Mo.	[3]36,000

[1]Includes gathering lines.
[2]Capacity estimated on basis of average quantity of oil handled daily in 1917.
[3]Estimated.

CANADA OIL PRODUCTION APPROXIMATES THAT OF 1916—SOME FIELDS DECLINING

Older Ontario Sections Dwindling Steaily—Heavy Drilling Costs Handicap Production in Calgary—Prices Rule High.

Chatham, Ont., Jan. 25, 1918.

A petroleum production very close to that of 1916 is indicated by unofficial figures for the year 1917, for the Canadian fields. There is a possibility that exact official figures may show an increase over the previous year. Then, too, there is some production from the Calgary field, which is not officially recorded, owing to the fact that no bounty payments are made in the western provinces. With the Calgary production included, the total Canadian production for 1917 will approximate between 205,000 and 210,000 barrels.

In the older Ontario fieds of Lambton, Bothwell and Tilbury, however, the decline so noticeable in recent years—a decline very gradual, but as certain and steady as clock work—is still manifested. Two new producing areas, the Thamesville and Mosa pools, figure in this year's returns; deducting these, the decline in the older fields is more marked.

The extent and nature of the decline may be seen by a comparison of the official figures for the first nine months of 1916 with those for the same period of 1917. Official figures for the last quarter of 1917 are not available, but unofficial figures indicate that the trend in these months is the same.

Lambton Pool.

(PETROLIA AND OIL SPRINGS.)

Month.	1916.	1917.
January	8,902.05	10,854.12
February	10,310.25	8,846.20
March	10,782.17	8,181.00
April	10,635.19	12,952.22
May	14,011.29	12,016.28
June	14,591.08	12,528.22
July	11,247.34	10,345.05
August	14,325.29	12,314.32
September	11,157.04	9,384.15
October	12,061.33	.....
November	10,672.21	.....
December	13,508.07	.....
Total	142,208.06	

Bothwell Pool.

January	2,789.02	2,617.22
February	2,607.29	1,692.27
March	2,671.28	1,309.00
April	2,278.22	4,170.01
May	3,140.34	2,335.13
June	3,210.24	2,541.05
July	2,578.05	2,980.02
August	3,099.11	3,071.07
September	2,515.02	2,441.08
October	2,520.32	.....
November	3,118.22	.....
December	3,328.02	.....
Total	33,856.08	

Dutton Pool.

January	108.24	344.07
February	235.05	.....
March	.....	.....
April	103.25	143.34
May	218.11	254.15
June	417.09	672.18
July	264.04	284.23
August	248.06	432.02
September	100.01	160.11
October	358.24	.....
November	227.24	.....
December	569.16	.....
Total	2,851.29	

Tilbury Pool.

January	951.11	1,324.16
February	526.30	421.08
March	3,369.19	748.28
April	1,426.27	991.12
May	620.26	1,182.30
June	2,455.24	1,022.32
July	143.05	280.14
August	1,874.33	840.02
September	1,099.15	717.24
October	249.15	.....
November	1,764.22	.....
December	914.04	.....
Total	16,296.31	

Onondaga Pool.

February	59.19	.....
July	157.04	.....
August	752.19	.....
September	29.09	259.06
October	491.13	.....
November	.....	.....
December	127.23	.....
Total	1,617.17	

Total for Year 1917.

At the moment of writing the detailed official figures of production for the last three months of 1917 are not available; but a careful unofficial estimate, which may be taken as reliable, indicates the following totals for 1917, as compared with the official production for 1916:—

Pool.	1916.	1917.
Lambton	142.208	137,095
Bothwell	33,856	31,749
Tilbury	16,296	9,287
Dutton	2,851	3,463
Onondaga	1,617	361
Belle River	46	.....
Moda	.....	8,554
Thamesville	.....	6,079
Totals	196,874	196,638

Of the older pools, only one, that at Dutton, in Elgin county, shows an increase; and the increase there, like the production itself, is merely nominal. The decline in the Lambton and Bothwell pools continues but is very gradual. The Petrolia and Oil Springs fields, included in the Lambton pool, have been producing almost continuously for over 55 years; and when it is considered that there is practically no new drilling in these fields, and that consequently no new sources of supply are available, the showing of these fields is remarkable. They certainly have notable qualities of permanency. Not a little of this permanency, however, is due to exceedingly careful operation. The operators in Petrolia, Oil Springs and Bothwell have reduced economy to a science. The development and improvement of the central pumping system, involving the use of jerker-rods, enables wells of only a few gallons individual production to be operated at a profit.

High Prices Obtained.

Production has been kept up, also, by existing high prices for Canadian crude. In 1916 the average price for Canadian crude was $1.94 7/13, the high mark for that year being reached in December, $1.98 per barrel. Several increases have since then been recorded, the scale of prices being:—January 2, $2.08; January 6, $2.18; January 28, $2.23; April 19, $2.28, August 21, $2.48; the last named being now the ruling figure. When to this is added the 52½c. government bounty, it will be seen that the Canadian producer realizes $3½ per barrel for his oil. Oil Springs' crude commands 7c. extra.

These prices have stimulated the producers to do their utmost in the way of adding to the crude oil supply, and have doubtless kept in operation numerous small wells that, had oil continued at 1914 prices, would have been long since abandoned. On the other hand, should prices suddenly go back to anything like the old level, it is probable that the Canadian decline in production would, for a while, be very marked.

In recent years there has been practically no new drilling in the older Lambton and Bothwell fields. The Tilbury field is still producing oil from a few leases, notably the Halliday lease near Fletcher; but quite a few wells have been abandoned this year, and no new oil production is being secured.

Fields Abandoned.

The Belle River field in Essex county, comprising a few very shallow wells drilled in 1913, has been abandoned, having produced nothing since early in 1917. The Onondaga pool in Brant county, the most easterly of the producing areas, has become a negligible factor so far as oil production is concerned.

On the other hand, two new producing areas figure in the returns for 1917. The Thamesville pool is in the northwestern part of Kent county, a few miles from the village of Thamesville. Development work was carried on these very extensively by the Vacuum Gas and Oil Company, of Toronto, in the fall of 1916, and continued in 1917. These operations proved up a small producing area, about two miles long by half a mile wide, the oil being secured at shallow depth. Some shipments made in the latter part of 1916 were included in the Bothwell production; in 1917 Thamesville production was classified separately, as follows:—January, 1,078 barrels; February, 859; March, 454; April, 802; May, 310; June, 1,662; July, 280; August, 284; September, 118. Some eight or ten years ago a similar production was developed from another small pool near Thamesville, but owing to it being top show oil, the production did not last; and the belief of experts is that the present Thamesville pool will not prove much more enduring.

The Mosa pool is in Middlesex county, the first producing well being drilled in February. Here about two dozen wells, mostly small pumpers, have been completed in the course of the year. F. J. Carman, of Los Angeles, was the discoverer and is the chief operator in this field; though several other companies and individuals have secured leases and finished a number of producing wells. Most of the oil in this field is reported to be from the upper lime, though in some wells a productive lower lime has been reached, which gives promise of some permanence. The official figures of production for the first months of 1917 are:—March, 116; May, 288; June, 1,569; July, 2,028; August, 1,232; September, 411. In the early part of the year production was held back by lack of shipping facilities. Recent reports state that some of the small pumpers drilled earlier in the year have been already abandoned, and that attempts to extend the field outside the small area already proven have resulted in the drilling of several dusters. The field seems to be limited to a small area between Glencoe and Newbury, and its permanent value is doubtful.

Kent County Production.

Attempts to extend the gas producing area of Kent county by drilling in Dover township, north of the Thames River, have resulted in developing an oil production in one well. This well, Union Natural Gas Company No. 1, was finished last May, and started with a production of 5,500,000 cubic feet of gas per day with rock pressure of 1,285 feet. The production was secured in the Trenton formation at 3,185 feet depth. The gas was fed into the Sarnia pipeline, since when the well has gradually been turning into an oil well, at last reports being credited with 2,000,000 cubic feet of gas per day and between 60 and 80 barrels of oil. The well is now being pumped, this production being merely the flow accumulated in the tanks. A pipeline has been constructed to the nearest shipping point at Pain Court. Since this well has been completed, deep wells have been drilled in practically every direction, but though several of these have been continued to the granite, practically no indications of oil or gas have been encountered. It looks as though the first Dover well was something of a freak.

New Production Temporary?

On the whole, the new production secured in 1917 seems to be of dubious permanence; and, unless the Dover field extends in the one direction so far untested, the north, it is improbable that any of these new pools will do much to stay the decline in Ontario crude production. The extent of this decline may be better shown by a comparison of the figures for 1917 with those for 1907. In the latter year, the Tilbury field was at its height of production, and the Lambton fields were doing twice as well as they are now. Here are the comparative figures:—

Pool.	1907. Barrels.	1917. Barrels.
Lambton	304,212	142.208
Bothwell	42,727	[illegible],749
Tilbury	111,588	9,287
Leamington	6,733	.....
Dutton	14,477	2,463
Thamesville	*1,5[illegible]	†6,0[illegible]
Comber	651	.....
Onondaga	.....	361
Mosa	.....	8,554
Totals	80,[illegible]	196,[illegible]

* Old pool. † New pool.

The figures emphasize, too, the impermanence of the newer Ontario pools as compared with the older producing areas at Petrolia and Oil Springs, in Lambton, and at Bothwell, in Kent. Tilbury, Onondaga, Dutton, Belle River, Comber, Leamington and both the Thamesville pools, are all new developments. Petrolia was producing for a quarter of a century before the drill tapped any of this newer production. Yet Petrolia appears bound to survive them all. It seems as though the earliest oil seekers in Canada had the lucky chance to hit the one spot where paying oil could be had. Widespread drilling only serves to emphasize the fact that Williams, Shaw and the other pioneers were better led by blind chance than the modern operators are by fifty years of developed petroleum science. The Tilbury pool has been the only big thing developed since then, and it has not been lasting.

Ontario Wildcatting.

In addition to the fairly successful wildcatting carried on at Thamesville, in Mosa township, and in Dover, several other tests are reported drilling in other parts of Ontario. In Grey county three drilling outfits are or have been at work near the village of Flesherton. Canadian Oil Fields, Ltd., of Brantford, started drilling No. 1 well at Flesherton in April. The formations proved unfavorable, so the rig was moved three miles northeast of the village, and No. 2 well is now down 1,740 feet, 600 of which has been in the lower Trenton lime. Some oil showings and gas indications are reported, and are thought to be connected with a larger production in the Potsdam sand, at the bottom of the Trenton. The Midland Oil Company is drilling at 1,450 feet or thereabouts, half a mile south of Flesherton, and the McKenzie & Mann interests, of Toronto, have a test down between 600 and 700 feet at Saugeen Junction. Neither of these has encountered any showings. There are some real indications of oil and gas in Grey county, the geological formations are favorable to a considerable degree, and it is possible that careful drilling may develop a production in a limited area as good as that in Mosa and more permanent.

The Trenton Oil and Gas Company, of Toronto, and the Rockwood Oil and Gas Company, are reported to have made locations on the Rockwood anticline in Halton and Wellington counties. At this point, between Campbellville and Rockwood, geologists have discovered a "dome" favorable to the retention of oil and gas, and there are some surface indications of the latter. Men connected with the Imperial Oil Company are backing one of the tests, though it is understood that the company itself has no financial interest in the undertaking.

New Brunswick Oil and Gas.

The figures of crude oil production from Ontario, previously given, will be supplemented by a nominal production from the Albert county fields near Moncton, New Brunswick. This production in 1916 approximated 2,000 barrels, and for 1917 will be between 1,000 and 2,000 barrels. The oil is sold locally unrefined. The Albert field is chiefly noteworthy as a gas producing area. It is controlled by the New Brunswick Gas and Oilfields, Ltd., a corporation backed by British and New Brunswick capital, and which holds a crown lease covering large areas in New Brunswick and giving it a practical monopoly of the potential producing areas in that province. The company, which was formed several years ago as a merger of two previously existing companies, has formulated a policy of sure but gradual development, involving expenditures of approximately $50,000 a year in development. The first undertaking was the cleaning out and deepening of the existing wells, which added considerable to the available gas production, and practically doubled the incidental production of oil. This year a new well on the Moncton edge of the field, No. 45, has been completed, with an estimated gas production of 2,500,000 cubic feet per day. The gas from this field is piped to Moncton and Hillsboro, and distributed locally by the Moncton Tramways Company.

Outside of New Brunswick no drilling operations have been reported this year in the Eastern provinces of Canada, though the Standard Oil Company is reported to have leased some territory in Cape Breton, Nova Scotia, with a view to drilling for oil. There are some indications of oil in this province, but no commercial production has ever been secured.

Negotiations were renewed this year with a view to the commercial development of the large oil shale deposits in New Brunswick, at Baltimore and Albert Mines, but no actual development work has been undertaken.

Western Canada.

As the Calgary oil production receives no government bounty, the Trade and Commerce Department returns give no figures on production in that field. Available figures in regard to the refining operations of the Southern Alberta Refineries, Ltd., at Okotoks, indicate, however, that the Calgary field produced approximately 10,000 to 15,000 barrels of high grade crude oil in 1917. This is merely an estimate.

So far as an extensive production is concerned, the Calgary field, after five years of steady drilling operations, is still a negligible factor, and there seems no immediate prospect of securing large production, though a few of the better-financed and better-managed companies are continuing drilling operations and express themselves hopefully regarding the ultimate outcome. A great deal of money was wasted at the time of the Calgary boom, three years ago, in duplication of tests and expensive management, and today, in the face of high drilling costs, the companies find themselves handicapped by lack of funds and lack of public confidence, the latter engendered by the scarehead methods of numerous boom companies.

The Calgary situation has reached a stage where operations are practically confined to bona fide development work by men who are after oil. There are more actual indications of oil in Calgary than there were when the boom was at its height. The early operations covered a wide area, extending to the north of Calgary as well as to the south, where the original oil showings were encountered. Tests to the immediate northeast and northwest have been failures, but the drilling has defined a limited area near Okotoks. A. W. Dingman, manager of the Calgary Petroleum Products Company, recently defined the field as follows:—

Calgary Field.

"The Calgary oil field comprises the area of territory contained within ranger 2 and 3, township 20 and 19, west of the fifth meridian, and more particularly described as lying centrally along the median line between the ranges. It is to be noted, however, that while most of the development work so far has been within this area, geologically it is considered that the oil and gas horizons extend south and southwesterly for a considerable distance, and that the territory possessing possibilities for the production of 'paraffine-base' oil in commercial volume may be said to extend from Calgary southwest to the international boundary, in the neighborhood of and parallel to the foothills of the mountains, a somewhat extended area, requiring considerable more geological investigation and operative tests to be made before the commercially productive areas can be fairly well outlined and determined. The most promising work is now being done on and along a pronounced anticline in the Turner Valley, some 35 miles to the southwest of Calgary."

In this area some eleven wells have been drilled. One of these, the Southern Alberta No. 1, has been steadily producing for a year or more as a flowing well. Another, the Alberta Petroleum Consolidated No. 2, has recently been put on a pumping basis, with an estimated initial production of 50 barrels a day. In practically every one of these wells light oil has been encountered at several horizons, the most productive of these being around 3,500 feet. The oil varies from 50 to 65 deg. Baume. Of the eleven wells, the Southern Alberta No. 1 is probably the most productive yet drilled, the oil ranging from 50 barrels a day down to a mere seepage of one or two barrels a day. In addition to the oil, most of the wells in this area have some wet gas. The two Dingman (Calgary Petroleum Products) wells have 4,000,000 cubic feet a day of gas, according to the company's figures. Many operators believe that, underlying the oil sands already discovered, is a larger oil reservoir from which the light oil so far secured has percolated or filtered upward. The Dingman No. 1 well has been drilled to nearly 4,000 feet without encountering any such reservoir, but the Dominion Geological Survey estimated some years ago that in this field drilling might be carried to 6,000 feet and that commercial oil was most likely to be met with at that depth.

Drilling Cost High.

The situation in Calgary is this:—Oil has been discovered at various depths, underlying a fairly defined area. The quantity, however, is in most cases insufficient to render development profitable when the high cost of drilling and the heavy capitalization of the companies are concerned. It was estimated some time ago that it cost $120,000 to drill one of the early wells to a depth of 3,500 feet. Some of the later wells were less expensive; but at the present price of labor, freight and materials, there is little to encourage new capital to embark in the venture. For these reasons none of the existing wells has yet been carried to the depth where, geologically considered, the greatest production is looked for.

The existing companies are, however, carrying on. Several of the wells now drilling were started in 1914, and are still unfinished. Financial conditions, scarcity of material, and drilling difficulties have all handicapped development.

Two Small Refineries.

There are two small refining plants in this area, the Southern Alberta Refineries, Ltd., which last year handled the output of the Southern Alberta No. 1, and the Canada Southern Refinery, which is to handle the production of Alberta Petroleum Consolidated No. 2. The first-named company this year paid a 10 per cent. dividend, being the first company operating in the Calgary field that has done so, and the output for the year approximated $100,000 worth of gasoline and distillate.

Calgary Petrol, Ltd., a subsidiary of the Calgary Petroleum Products, Ltd., with an infusion of California capital, is erecting a casinghead gasoline plant to treat the wet gas from the Dingman wells. This plant was to have been operating by September, but the last of the machinery has only just arrived.

The Viking Field.

The Northern Alberta Natural Gas and Development Company has continued active drilling operations in the Viking field, 75 miles east of Edmonton. This company has now seven completed gassers, with an estimated production of 35,000,000 cubic feet. The gas was to have been piped to Edmonton by March next, the company having secured a franchise to distribute in that city; but owing to the high cost of pipe and other materials, it is doubtful

if the construction of the pipeline will be undertaken till after the war.

Incidentally, No. 2 well, a short distance north of the village of Viking, showed oil as well as gas. The oil was of a heavy, tarry nature. A subsidiary company, the Alberta Volcanic Oil Company, has been organized, which has taken over the southern leases of the Northern Alberta Natural Gas and Development Company, and will test them for oil. The Imperial Oil Company is also reported to be planning development in this field. In addition, several Calgary companies have either already moved their rigs to leases in the vicinity of Irma, or intend moving outfits into the field early next spring.

The Viking field is a proven gas field of large extent and capacity, with incidental unproven possibilities of commercial oil of the asphaltic type. The oil is far heavier and less valuable than the Calgary oil, but may make up in quantity what it lacks in quality. The geological indications are that it is distributed over a wide area.

Peace River Oil.

After two years of drilling an oil strike was this fall reported in the Peace River district.

Operations were commenced in this district in 1915 by the Lord Rhonda interests, which drilled an unsuccessful test near Vermilion Chutes. Later, the Peace River Oil Company, in which J. D. McArthur, of Winnipeg, is largely interested, drilled a test near the village of Peace River. This test struck a small showing of oil at about 875 feet. On deepening the hole a heavy flow of water and gas was struck around 1,150 feet, which wrecked the derrick and forced the drillers to abandon work on that location. In June a new location was made a mile distant from No. 1 well, and in October the drill struck oil at about 800 feet. Early estimates credited the well with 50 barrels a day, but the most reliable information is that it has a potential production of 10 barrels at this depth. The oil is of the heavy asphaltic type. The directors are considering deepening the well, in the expectation that, if the water and gas difficulties encountered in No. 1 are solved, a larger oil production will be secured in the lower formations. If this is not done, a new test will be started nearer to Peace River Crossing, and toward the crest of the anticline.

No oil developments of commercial importance have taken place in the Athabasca district of Northern Alberta; nor has there been any important drilling for oil in the provinces of Manitoba and Saskatchewan.

In the western province of British Columbia the Pitt Meadows Oil Wells, Ltd., of Vancouver, is drilling again at Pitt Meadows, and has encountered some slight oil showings. A resumption of drilling activity in the Flathead Valley in the Kootenay district is also reported.

Ontario Natural Gas.

The natural gas production of Ontario for 1917 will probably figure much larger, both in the aggregate amount of gas marketed and in value of the product, than for any preceding year. As the only official figures are those compiled by the Ontario Bureau of Mines, and as these will not be available, or even complete, for several months, it is impossible at present to give the exact totals; but information secured from the larger individual producers and pipelines indicates that the production of the Tilbury field will show a large increase. The Elgin field also produced more. The small field at Oil Springs, in Lambton county, is on the decline. Though the Oil Springs Oil and Gas Company has maintained a sufficient supply for its customers in the village of Oil Springs, the deep wells, drilled in 1914, have ceased to be a large factor in the calculations of the pipeline companies furnishing gas to Petrolia and Sarnia.

The Welland-Haldimand-Norfolk-Brant field, often referred to as the Niagara field, will probably maintain close to the production of 1916. The operating companies in this field are still drilling to secure new production, and with some success, though drilling is more successful in the western end of the field, particularly in Norfolk county, than it is in these portions of the field further east. There are not wanting, however, indications of diminishing supply. The Provincial Natural Gas Company, which supplies Fort Erie, Niagara and other points, has been compelled to restrict distribution; and the step has been taken of cutting off industrial users in the winter months. The same policy is followed to some extent by the Dominion Natural Gas Company and its various subsidiaries.

While the production of the Kent field for 1917 will probably be the largest yet recorded, the year ended with complaints in many quarters regarding the shortage of gas, and the Union Natural Gas Company for the first time in its history took the drastic step of requiring its local distributors to cut off industrial consumers, and to conserve the gas for domestic uses. The difficulty appears to have been that, while the production is still large, the coal shortage led to many new users of gas being taken on, with the result that the drain on the field became too heavy, and on extremely cold days the pressure dropped almost to the vanishing point. It is estimated that if the use of the gas is restricted to domestic purposes—cooking and light heating—the field will probably last for from five to ten years.

Since the close of 1917 the Ontario Municipal and Railway Board has, at the request of the Ontario Government, opened an investigation into the gas shortage. The evidence of producers and consumers has been taken, an expert examination will be made of the field, and the legal points involved in certain contracts between pipeline companies and local distributors will be also taken under advisement.

Four Principal Companies.

There are four main companies now drawing gas from this field. The Union Natural Gas Company supplies Windsor, Chatham, Sarnia, Petrolia, Tecumseh, Belle River, Sandwich East and West, Sandwich South, Maidstone, Rochester, Essex, Tilbury, North and West Comber, Romney, Tilbury East, Raleigh, Harwich, Howard, Highgate, Blenheim, Ridgetown, Dover, Chatham township, Dresden, Tupperville, Sombra, Moore, Courtright, and the Imperial Oil Company at Sarnia. The latter has been cut off since the cold weather. This company has some 3,918 acres of gas territory under lease, and since commencing operations in 1912 has tested out and abandoned as unproductive leases covering 14,916 acres. The open flow of the Union wells last summer totaled 63,165,000 cubic feet per day. At the end of 1917 the company had 137 producing wells, and sales of gas for the first 10 months of 1917 totaled 5,105,780,000 cubic feet, as compared with 5,630,000,000 cubic feet in the 12 months of 1916. From January 1, 1912, to October 31, 1917, it is estimated that the Union Natural Gas Company has spent in drilling operations, new lines and plants, $1,148,018. The company has a large pumping plant at Port Alma, and about 350 miles of pipeline.

Wallaceburg is supplied by the Northern Pipeline Company, the controlling interest in which is held by interests close to the Union Natural Gas Company.

The Canadian Gas Company, formed in 1913, has 2,500 acres of leases, with 40 producing wells and an open flow of approximately 12,500,000 cubic feet per day. This company furnished approximately 40 per cent. of its production to the Northern Pipeline Company for distribution at Wallaceburg, and the remaining 60 per cent. goes to the Union Natural Gas Company for Sarnia. The company has no pumping plant.

The Beaver Oil and Gas Company has leases covering 725 acres, 23 producing wells, and an open flow of 2,500,000 cubic feet a day. Its gas sales in 1917 are estimated at 787,405,000 cubic feet. It supplies direct consumers, both industrial and domestic; supplies the town of Leamington, and disposes of the balance of its production to the Southern Ontario Gas Company.

The Glenwood Natural Gas Company sold approximately 114,000,000 cubic feet of gas in 1917; and the Southern Ontario Gas Company sold 317,500,000 cubic feet. The latter company is a pipeline company, and handles part of the Glenwood production, supplying to local distributing companies in Woodstock, Ingersoll, Hamilton, Brantford, Paris, Galt, and to manufacturers in London. The Glenwood Natural Gas Company is the producing company, and has 48,425 acres under lease. Of these, 4,526 acres are proven gas territory, with 80 wells. Included in this acreage is approximately 1,800 acres covered by a crown lease of drilling rights "off shore" in Lake Erie. Some eight or nine producing wells have been drilled in the bed of the lake. The open flow of the Glenwood wells last September was 34,962,000 cubic feet per day; that of the Beaver Oil and Gas Company at the same time was 12,083,608 cubic feet per day. The total amount of gas produced and marketed by the Beaver and Glenwood companies in 1917 is estimated at 3,977,691,000 cubic feet.

Still Considerable Drilling.

There is still considerable drilling going on in this field. The Southern Ontario Gas Company, the Glenwood Natural Gas Company and the Beaver Oil and Gas Company have confined their operations largely to the older fields of Romney and Tilbury East townships. Last year there was a considerable extension of the field from Tilbury East township toward Merlin, resulting in some new production being secured. This development was not carried on in 1917, however, except for a little drilling early in the year. The Union Natural Gas Company early in 1917 did some drilling in the Romney and Tilbury East parts of the field; it was noticeable, however, that a large proportion of the wells finished this year in the old territory were small gassers, around 250,000 cubic feet; while a couple of years ago a 1,000,000-cubic foot gasser was considered only a fair minimum. This rock pressure, 580 pounds when the field was developed ten years ago, has declined to about 350 pounds.

Early in the year the United Development Company (Pattinson & Ryan), of Chatham, tried to develop some production eastward, in Raleigh, toward Cedar Springs and Charing Cross, but secured only one small producer, two other deep wells being dry. The Southern Ontario Gas Company started a deep well on Point aux Pins, government park, Rondeau, but secured nothing. These attempts served further to negative the possibility of extension toward the east.

The Union Natural Gas Company then undertook deep drilling operations in Dover township, north of the Thames, and about 15 to 20 miles due north of the Tilbury-Romney productive area. No. 1 well struck gas in the Trenton in large volume, 5,500,000 cubic feet, and under 1,285 pounds rock pressure. The Union has since then drilled four tests north, and one south of the river Thames; the United Development Company has drilled two on the Tilbury East side and one in Dover, and the Canadian Gas Company has started one near Tilbury. Practically all of these have been drilled to the Trenton, except the last mentioned; two of the Union tests have been drilled to the granite; and except for a slight trace of gas in the upper Trenton in one of the United Development wells, no showings have been secured. It is probable that all these tests will be carried to the granite, through the Trenton formation and the underlying Potsdam sand, but the outlook is no longer hopeful for a large field. It is reported that tests will be made further north, near Wallaceburg, but no location has yet been made.

Elgin Field.

In the Elgin field the development is in the hands of the Medina Natural Gas Company and the Richmond Oil and Gas Company, both of Chatham. The first named company developed a field at Vienna some years ago. The wells are comparatively small, and new drilling is required to maintain the supply. These companies market their production through the Central Pipeline Company to Aylmer. The Dominion Natural Gas Company also has some production in this field, which is marketed to its consumers further east.

The Richmond company late in 1916 drilled a 2,500,000-cubic foot gasser near the village of Richmond; and thereby marked a new extension of the Vienna gas field. Since then this company has drilled five additional wells, three of them productive; the Dominion Natural Gas Company has drilled one or two producing wells; all these are south of Richmond. The Vacuum Gas and Oil Company drilled a duster north of Richmond. This company also secured some gas at Maybee's Corners, near Tillsonburg, but attempts to extend the field were unsuccessful. The Dominion Natural Gas Company has secured some new production near Lynedoch and Port Burwell, further east, in the Norfolk field.

Western Canada Gas.

In addition to the newly developed Viking field near Edmonton, Alberta, the production of which is not yet being marketed, there are two large fields in Southern Alberta now producing and marketing gas.

The Medicine Hat field, at and near Medicine Hat, Alberta, has witnessed little new development this year. This is due to the high cost of drilling, and the fact that the production already developed is ample for the city's needs. One new well was drilled in 1917 with a capacity well up to the average of 2,500,000 cubic feet. In this field the city of Medicine Hat now owns and operates 14 gas wells, while 12 wells in the Medicine Hat field are privately owned and operated. The value of the production owned and marketed by the city in 1917 approximated $110,000. The capacity of the Medicine Hat wells averages 2,500,000 cubic feet per day. On October 1 the city advanced its rates to private consumers to 20c. per 1,000, and fixed the industrial rate at 5c. per 1,000.

Bow Island Field.

The production of the Bow Island field for 1917 will probably show a considerable increase over 1916. This production is marketed by the Canadian Western Natural Gas, Light, Heat and Power Company, which supplies Calgary, Okotoks, Grannum, Claresholm, Lethbridge, and intermediate points. The gross earnings of the company for its fiscal year ending September 30 were $991,320, as compared with $897,995 for the previous year, this being the best year in the company's history. Net earnings amounted to $198,738. Two new wells were drilled in 1916 and three in 1917, all being good producers.

The city of Calgary has been approached by the Calgary Petroleum Products, Ltd., owners of the Dingman wells, for a franchise to supply gas from the Calgary field to portions of the city outside the area covered by the Canadian Western franchise, but no action on this proposal has yet been taken.

The United Oils, Ltd., has a well on the Sweetgrass field of Southern Alberta, with an estimated production of 18,000,000 cubic feet per day, open flow. The owners have negotiated with New York capital regarding the construction of a pipeline to market the gas, but so far nothing has eventuated.

MEXICAN CRUDE PRODUCTION 17,000,000 BARRELS GREATER THAN IN YEAR 1916

Nearly 47,000,000 Barrels Water Shipped During Period, an Increase of Almost 16,000,000 Barrels—2,000,000 Barrels Sent Out in Tank Cars.

Tampico, Mexico, Feb. 7, 1918.

The oil production from the Mexican fields for the year 1917 shows an increase of approximately 17,000,000 barrels over the previous year, 1916. The production for the year just ended was 54,590,439 barrels, compared with 39,801,110 barrels for the year 1916. This production will probably place Mexico in second place as an oil producer, as the production from Russia, due to the European war, undoubtedly has been greatly decreased.

The 1917 production is eleven times greater than the republic produced in 1910, four times more than it produced in 1913, three times as much as in 1912, more than twice the production of 1913. In 1914 the output was 26,235,403 barrels., in 1915 the figures were increased to 33,927,950 barrels, and the 1917 figures top the 1916 report by some 17,000,000 barrels.

Field Production.

Divided by fields the past year's production is substantially as follows:—

	Barrels.
*Southern fields	38,250,825
Panuco	14,365,264
†Ebano and miscellaneous	1,150,596
Topila	823,754
Total	54,590,439

* Includes Furbero.
† Includes Isthmus of Tehuantepec and Los Cerritos.

The Mexican increase was brought about by the increase in exportation during the year just passed.

Crude Oil Since 1904.

Following table shows amount of crude oil produced in Mexico since the beginning of the industry in that country up to 1918, in barrels:—

Year.	Production.	Year.	Production.
1917	54,590,439	1909	2,488,742
1916	39,801,110	1908	3,481,610
1915	35,500,000	1907	1,717,600
1914	21,188,427	1906	1,097,264
1913	25,902,439	1905	320,379
1911	14,051,643		
1912	16,558,215	1904	220,653
1910	3,332,807	Total	226,660,979

Field Work Disappointing.

The field work during the year, in so far as the development of new pools is concerned, has been a disappointment. Panuco gave its quota of new wells, which were good producers, as usual. In the Tepetate Chinampa district, in the southern fields, two excellent wells were brought in, but apart from these two completions other drillings in this section were not up to expectations.

As the year closed the Penn Mex Company brought in a good well in the Molino district, which is just north of the Tuxpam River, and another just south of this river, but the latter was in a proven field.

Wildcat wells completed in Tamaulipas and sections of northern Vera Cruz were failures mostly. These failures were costly, as the oil companies paid as high as $250 per hectare yearly rental for land near dry holes in the Tepetate district, besides payment of large cash bonuses by some companies.

Setback Due to War.

There is an enormous amount of capital invested in the oil business in Mexico, but as yet, owing to internal troubles in Mexico and the setback caused by the European war, small returns have been received by the stockholders in these companies. This condition, however, is purely temporary, and with the return of peace abroad and the consequent release of ocean transportation sufficient to carry Mexican petroleum to the world's markets, returns will be received by those who have the patience and capital to await such a moment.

A considerable number of small companies and many of the larger companies are going ahead and spending millions of dollars in developing their holdings, constructing terminals, pipelines, refineries, etc. Notable in this respect are the Standard Oil Company of New Jersey, the Texas Company of Mexico, the Mexican Gulf Company, Island Oil and Transportation Company, Huasteca Petroleum Company, New England Fuel Oil Company, Freeport and Mexican Fuel Oil Transportation Company, and the Corona Company, the Mexican subsidiary of the Royal Dutch Shell.

Notwithstanding the present conditions due to unsatisfactory working conditions in Mexico and the inability to secure sufficient ships to move the production due to the demand made upon tonnage by the European war, the oil situation here is brighter now than it ever has been, and a general resumption of exploration and exploitation work is looked for this year. This, however, will depend on the ability of exporting companies to secure sufficient tankers to transport their oil and the ability of all concerned to secure the necessary supplies from the United States sufficient to carry on their business and go ahead in the development of new work.

Shipments and Distribution.

Shipments of Mexican petroleum during the year, including crude oil, topped crude (prepared for oil), and distillates, totaled 46,054,158 barrels, all of which was cleared for export delivery with the exception of 3,971,441 barrels, which went Mexican coastwise, principally to the Mexican Eagle Oil Company's refinery at Minitilan in the Isthmus of Tehuantepec, with a few cargoes of fuel oil to Vera Cruz. Of this total movement from ports of primary clearance, Tampico dispatched 32,537,821 barrels and Tuxpam 13,516,337 barrels. These figures show an increase over the 1916 movement of 15,965,815 barrels. In part they include some items of bunkering on foreign-bound steamers, which will also apply in part in the distribution to various countries, which were as follows:—To the United States, 4,515,388; to Mexican coastwise, 3,971,441; to Canada, 678,015; to Great Britain, 574,289; to Central America, 560,284; to Panama, 273,762; to West Indies (other than American possessions), 85,295; to the Continent, 9,585.

Tank Car Movement.

In addition to the shipments noted, the domestic movement in tank cars aggregated 2,002,711 barrels of fuel oil, a notable increase over the tank car movement in 1916, which reflects better than anything else the steady rejuvenation of Mexican railway traffic and of the republic's manufacturing industries. Tampico's refineries and topping plants, additional bunkerage and local consumption of fuel oil, accounted for about 7,529,366 barrels of crude other than the oil run through these plants and accounted for under the head of export shipments. The sum of these three items is 56,586,235 barrels, but a comparison of oil held in steel storage at the close of 1917 with the volume of oil in similar storage at the close of 1916 shows a deficiency of 995,796 barrels, which accounts for the distribution figures topping the actual figures of production.

Stocks Held.

Crude and fuel oil held by refineries and producers in steel storage as 1917 passed into 1918 totaled 12,135,030, as against 13,131,826 at the close of 1916. Earthen storage totals 8,467,835 barrels, some of which would probably not be marketable as oil.

Of the shipments dispatched from Tampico, crude oil was represented by 18,977,936 barrels; reduced crude, 10,270,668; distillates, 2,740,247, while to balance the total clearances given an item of bunkering not carried in the above figures is represented by 548,970 barrels. Tuxpam shipments represented only crude oil.

Fields in Review.

The following table epitomizes the field work in the republic during 1917:—

Fields.	Comp.	New prod.	Dry or aban.
Southern	14	122,500	9
*Topila	15	27,885	8
†Miscellaneous	14	50	13
Total, 1917	15	291,135	26
Total, 1916	37	129,000	21
Difference	38	162,135	5

* Completions include one large gas well.
† Includes Isthmus of Tehuantepec operations.

Reduced to a table by fields, the completed wells listed as commercial producers, appear as follows:—

	wells.	Prod.
Panuco	79	345,080
*Southern	55	470,349
Topila	21	31,795
†Ebano and miscellaneous	31	6,250
Totals	186	853,474

* Includes Furbero.
† Includes Isthmus, Los Cerritos and Chila.
Number of wells and daily potential production estimated.

$1,127,993,185 CAPITAL INVESTED IN 1917 IN NEW CORPORATIONS IN REPORTER TRADES

There Were 2,265 Companies Formed With Great Gains in Petroleum, Chemicals and Dyes—New Wyoming Oil Capitalizations More Than Million a Day.

There were 2,265 companies organized in Reporter markets during the year 1917. The authorized capital involved in these new corporations was $1,127,993,185. If this amount, $902,460,335 was invested in petroleum companies, $121,390,850 in companies manufacturing chemicals, $28,917,000 in paint corporations, $26,956,500 in drug manufacturing companies, and $48,268.500 authorized capital was involved in miscellaneous companies which include dye manufacturers, clay-working plants, bauxite mining companies and vegetable oil manufacturers.

The enormous growth of the industries covered by the Reporter is clearly shown by the figures compiled. The petroleum companies alone number 1,693 for the year, with an average capitalization of $533,024. The state of Wyoming was one of thte largest contributors to this total, with a capitalization for the year of $385,000,000, or an average authorized capital per day of approximately $1,000,000.

With the added demand by the government upon the chemical industry owing to the entry of the United States into the war 202 companies were formed during the year, with a total capital of $121,390,850. This amount of capital was greatly aided by the incorporation of several large companies, among whom is the Virginia Consolidated Chemical Corporation, which was incorporated in July under the laws of Delaware, with a capital of $3,000,000; the Mathieson Alkali Works, incorporated with a capital of $2,000,000 in July under the laws of Virginia; the East St. Louis Chemical

Company, incorporated under the laws of Delaware in September with a capital of $4,500,000; United States Industrial Chemical Company, incorporated under the laws of Maryland in November with a capital of $24,000,000; National Aniline & Chemical Company, incorporated under the laws of New Jersey with a capital of $18,960,000 in November, and the Marden, Orth & Hastings Corporation, which was incorporated in August under the laws of New York with a capital of $1,950,000.

Paint and Drug Companies.

The paint industry has to its credit 112 companies organized throughout the year, with a total authorized capitalization of $28,817,000. The Paraffine Companies, manufacturers of paints, incorporated in November with a capital of $15,500,000, was the largest company in this market organized during 1917. The average capitalization per company for the year was $258,185.

In the drug market there were 101 companies formed during 1917, with a total capital of $26,956,500, the average capitalization of the companies organized being approximately $269,568. April led all other months in the amount invested in the manufacture of drugs, $11,232,500 being the sum of the authorized capital for that month. January led in the number of new companies organized, twenty concerns being formed in that month, with a total capitalization of $690,000, or an average capitalization of $34,500.

Miscellaneous.

There were 157 miscellaneous companies formed throughout the past year, with a total capitalization of $48,268,500. These companies include dye concerns and manufacturers, bauxite mining corporations, clay working concerns and all oil companies not coming under the head of petroleum. The average capitalization of these companies for the year is $307,442. The month having the largest amount invested was December, with a total capitalization of $16,900,000. This gives an average of $545,161 per day for the amount invested during that month.

Recapitulation.

Following are five tables showing the number of companies formed each month in the different markets of the Reporter and the total capitalization by month and by year:

Petroleum Companies.

Month.	Number of companies.	Capitalization.
January	78	$20,648,000
February	111	40,779,500
March	178	94,694,700
April	215	59,871,600
May	73	22,545,900
June	155	74,283,100
July	131	138,801,600
August	163	90,553,000
September	145	122,928,000
October	72	64,358,710
November	167	86,330,800
December	165	86,662,425
Totals for year	1,693	$902,460,335

Chemical Companies.

Month.	Number of companies.	Capitalization.
January	32	$2,269,000
February	15	5,505,000
March	29	2,364,000
April	30	19,092,450
May	6	907,500
June	15	5,122,000
July	15	10,460,000
August	19	11,808,500
September	14	16,870,000
October	13	6,385,000
November	4	45,277,400
December	9	1,330,000
Totals for year	202	$121,390,850

Paint Companies.

Month.	Number of companies.	Capitalization.
January	17	$735,000
February	11	963,500
March	11	1,187,500
April	13	630,000
May	25	7,303,000
June	5	230,000
July	4	40,000
August	2	60,000
September	5	319,000
October	1	500,000
November	4	15,690,000
December	14	1,250,000
Totals for year	112	$28,917,000

Drugs Companies.

Month.	Number of companies.	Capitalization.
January	20	$690,000
February	13	3,115,000
March	13	263,500
April	10	11,232,500
May	2	20,000
June	3	175,000
July	6	8,041,500
August	6	410,000
September	4	1,575,000
October	3	95,000
November	11	1,010,000
December	10	329,000
Totals for year	101	$26,956,500

Miscellaneous Companies.

Month.	Number of companies.	Capitalization.
January	4	$480,000
February	16	5,545,000
March	9	1,835,000
April	28	5,380,000
May	14	2,605,000
June	13	1,185,000
July	5	171,000
August	17	4,216,000
September	13	3,481,500
October	7	2,000,000
November	15	4,470,000
December	16	16,900,000
Total for year	157	$48,268,500

Year's Totals.

	Number of companies.	Capitalization.
Petroleum companies	1,693	$902,460,335
Chemical companies	202	121,390,850
Paint companies	112	28,917,000
Drug companies	101	26,956,500
Miscellaneous companies	157	48,268,500
Grand totals for year	2,265	$1,127,993,185

1917 VEGETABLE OIL INDUSTRY IN GREAT BRITAIN MARKED BY GOVERNMENT CONTROL

The vegetable oil industry in Great Britain has passed through an adventurous year and on the whole it may be said that it has emerged from its numerous difficulties, arising out of war conditions, with a fair amount of success. For the greater part of the twelve months it has been subject to government control, increasing in scope almost month by month as the new conditions arose, until at the close it was as nearly absolute as it was possible to be, all production of oils and cakes and hardened fats (including margarine) being at the disposal of the government controller and distributed by his agents according to an official schedule of prices.

Fortunately, there have been fairly good and constant supplies of the "raw material" from overseas, notwithstanding all the terrors and inconvenience associated with the ruthless submarine warfare against peaceful merchant ships by an unscrupulous enemy. The official returns of gross imports by the British Board of Trade show that the arrivals were as under—the previous two years' figures being included for the purpose of comparison:—

Oilseeds.

	1917.	1916.	1915.
Castor beans, cwt.	808,557	819,016	556,305
Cottonseed, tons	219,015	329,237	494,585
Linseed, quarters	1,016,011	2,506,836	2,126,469
Rapeseed, quarters	305,505	375,087	192,336
Sesamum, quarters	115,810	....	....
Soya bean, tons	25,049	65,364	170,910
Unenumerated, qrs.	42,757	238,453	358,459

Nuts and Kernels.

	1917. Tons.	1916. Tons.	1915. Tons.
Copra	52,400	62,400	118,540
Ground (or pea) nuts	137,758	....	....
Palm kernel	248,100	241,501	233,249
Other sorts	9,274	69,121	96,448
Totals	447,592	373,023	448,327

The total value was declared at £26,212,526 sterling, against £26,293,921 sterling in 1916, or in round figures over $130,000,000 each year. Reduced to tons the total weight was 1,014,118 tons, against 1,393,642 tons in 1916, the falling off being equal to 27 per cent. Of these quantities there were re-exported to foreign countries 51,000 tons and 97,000 tons respectively. The quantity of oil nuts and kernels retained in Great Britain was 421,000 tons, or 82,000 tons more than the previous highest record. Prior to the war the annual importation of this class of material was only 56,000 tons, the sudden increase in the war years being due to the diversion of palm kernels, etc., from Hamburg which formerly absorbed fully four-fifths of the export from the British colony in West Africa. Having now got hold of this trade Britain intends to keep it and is also making headway with the manufacture of margarine (several new factories being in course of construction) which is the natural subsidiary industry. The smaller imports of linseed—only two-fifths of the 1916 total—was due to the reduced transport facilities from India and from Argentina. Very little cottonseed also came from India. From the beginning of May prices of all oilseeds and oilnuts imported into Great Britain were subject to an official schedule of maximum prices. Bombay (ordinary) linseed being at £30, after it had risen to £35 in the open market in the earlier months; Egyptian cottonseed, £19 for fair average quality, after touching £23; palm kernels £26@£26 10s., etc.

Official Maximum.

The fixing of an official maximum for all kinds of raw material, though it probably reduced supplies, enabled fixed maximum prices to be instituted for both oil and residue, though the restricted market conditions (all sales being subject to a license from the government department in the case of each sale) were against the top figures being immediately reached. As a matter of fact some months elapsed before linseed oil approximated to the official maximum, large stocks of this commodity being in warehouse. Raw linseed oil (naked) ex mill at Hull and subject to 2½ per cent. discount opened the year at 46s. per hundredweight, but fell to 42s. 3d. at the end of January, this being the lowest point of the year. Afterwards there was a steady appreciation in value, 55s. being recorded in April. It was not, however, until mid-October that it rose to the official maximum of 58s. net, since when it has been scarce, in view of small production and depletion of stocks, and difficult to buy at that figure.

Cotton Oil.

Refined cotton oil (ordinary soapmaking quality) began the year at 47s. per cwt. (less discount) and rose steadily to the official maximum of 67s. net in July, and supplies were exhausted by October and not replenished until the opening days of the present year. Crude cotton oil from Egyptian seed was a rather uneven market and ranged from 44s. 6d. in January to 60s. (less discount) in July, after which it relaxed to 56s. in September, but later recovered to 60c. net, the controller's maximum. The market was, however, bare of supplies in the closing weeks of the year. Soya bean oil opened at 49s. and rose to 57s. in April, when supplies ceased. Crude rape oil, made from brown East Indian seed, was very strong in the spring, and from 55s. in January had reached 72s., when in May the quotation was superseded by the official maximum of 66s. net. Hull makes of castor oil fluctuated somewhat, but on the year there was an appreciation of 16s. per cwt. The lowest point was 68s. for first pressure in January, and the highest 80s. net, the official limit. Comparatively little of this product came into the open market, the bulk being required on official account. Palm kernel oil or fat, which has become an important item in the output of Great Britain in the last two or three years, was in big demand and the market subject to more speculative trading than probably any other. So much was this so that from about 55s. to 57s. the quotation advanced to 77s., when the controller stepped in and fixed the limit at 51s. for extracted and 52s. for crushed (crude).

Three-Year Production.

The estimated production of vegetable oils in the United Kingdom during 1917 and two preceding years, together with the official return of imports, re-exports and exports, is as follows:—

	1917. Tons.	1916. Tons.	1915. Tons.
Castor oil	18,677	15,141	9,970
Cottonseed oil	37,237	55,968	84,044
Linseed oil	60,949	150,168	122,152
Rapeseed oil	17,113	21,476	8,638
*Sesamum oil	2,185	....	....
Soya bean oil	5,131	8,233	21,153
Other sorts	2,019	2,840	8,087
Total seed oil	141,941	253,816	254,044
Coconut oil	30,336	30,186	26,057
Palm kernel oil	101,587	95,404	94,082
*Ground nut oil	54,555	....	....
Other sorts	3,462	26,019	34,862
Total nut oil	189,940	151,609	155,001
Grand total of seed and nut oil	331,881	405,424	409,025

* Previous to 1917 included in "other sorts." (Tons of 2,240 lbs.).

	1917. Tons.	1916. Tons.	1915. Tons.
Imports of oil, refined and unrefined	111,486	145,854	160,290
Re-exports	36,340	20,181	48,725
Net imports	75,146	125,673	111,565
Exports of oil manufactured in U. K.—			
Seed oil	47,389	38,163	86,218
Nut oil	30,881	9,823	37,452
Total exported	78,270	47,986	123,760

The imports of oil included only 89 tons of linseed oil, against 9 tons in 1916 and 167 tons in 1915. The chief items of the imports were palm oil, 78,000 tons, of which 53,000 tons remained in Great Britain, and 20,000 tons unrefined coconut oil. Included under the head of exports were large quantities of linseed oil sent to allied countries.

The imports of oilseed cake from abroad were 212,892 tons, against 283,985 tons in 1916 and 418,161 tons in 1915.

The company owning the largest number of mills in Great Britain has just intimated to the shareholders that the gross profits in 1917 exceeded those of the previous year, and, after providing for excess profits tax, permit of a dividend of 15 per cent., the same as in 1916. This company besides building a large mill for palm kernel crushing has in hand two margarine manufactories.

The imports of petroleum into Great Britain in 1917 were 826,834,812 gals. (of which 440,582,168 gals. were fuel oil), the figures for 1916 being 451,556,152 gals. (of which 22,556,004 gals. fuel.)

Paints, Colors, Etc.

The manufacturers of paints, colors, varnishes, etc., were confronted with a strong advance in the prices of the principal materials and practically everything connected with production. Aniline dyes of English manufacture are finding their way into the market and a few suitable for the paint trade are now obtainable, which a year before were not even being manufactured. Several articles, such as barytes, white lead, zinc oxide, lithopone, ultramarine, bronze (metal) and other colors, which, formerly imported into Great Britain from Germany to the extent of $3,500,000, are engaging the attention of British manufacturers who are hopeful of being able to supply these in future. The manufacturers of barytes, for example, have offered to produce an equal quantity to the pre-war imports from abroad, which were valued at $500,000, within two years, provided they can be assured of equally favorable railway rates for their material as were accorded to German firms, who imported into Great Britain at "through" rates much below those charged to British manufacturers. They also ask for an "anti-dumping" law. If these two points are conceded they claim to be able to compete in quality, grinding and price with any foreign imports. In addition to the difficulty of obtaining raw materials, white lead, linseed oil and other things being only obtainable by government license, labor has been scarce owing to the great calls upon the manhood of the nation, the decorating trade especially suffering severely from lack of men and material. The export trade, too, has also been adversely affected, the total exports of painters' colors and materials during 1917 amounting to only 1,138,801 cwts., against 1,916,635 cwts. in 1916. This was caused to some extent by the government restriction of exports, a license being required in every case where shipment was requested, and many kinds refused export altogether on account of the prohibitions affecting certain classes of material. Trade with the colonies was much reduced and it was feared that Britain's loss in this direction was America's gain. In consequence of the strinpent trade conditions ruling, the terms of credit and discount hitherto allowed by manufacturers were considerably curtailed.

QUICKSILVER OUTPUT IN 1917 GREATEST IN QUANTITY SINCE 1883—36,351 FLASKS

Greatest Value Since 1875 Due to Average San Francisco Price of $106.12 Per 75 Pounds.

The domestic output of quicksilver in 1917, according to statistics compiled by H. D. McCaskey, of the United States Geological Survey, was 36,351 flasks of 75 pounds each, valued at the average quoted market price at San Francisco ($106.12 per flask) at about $3,857,000. The output was therefore the greatest in quantity since 1883 and the greatest in value since 1875. The production in 1916 was 29,932 flasks, so that the increase in 1917 was 6,419 flasks.

The productive states were California, Texas, Nevada, Oregon and Arizona.

The output of California in 1917 was 24,251 flasks, against 21,045 flasks in 1916. Quicksilver prospecting and mining, stimulated by war demands and favorable prices, have been active in California for the last two years. In 1917 the Abbott mine became a producer, with prospects of a considerable increase in 1918. The Helen mine continued production, and the Sulphur Banks made gains that are likely to be continued in 1918. The Big Injun was a new producer. The Patriquin continued production, and the output of the Bella Union and La Joya showed considerable gain. The New Idria yielded slightly more than in 1915 and remained the largest producer in America. The Cambria was idle but the Oceanic increased its output. The New Almaden and New Gaudalupe both showed material gains. The St. Johns again made a large output. The Culver Baer, Great Eastern, Cloverdale and Socrates all made gains, those of the first three being notably large.

The output of Texas was 10,759 flasks against 6,306 flasks in 1916, and the increased production is credited to the Chisos, Big Bend, Mariposa and Chisohm, in the order named. Further increase may be expected from the Terlingua district, which was long ago put on the map by these mines.

The production of Nevada decreased from 2,198 flasks in 1916 to 916 flasks in 1917, the decrease having been due in part to loss of the Goldbanks plant by fire and in part to decreased production from the lone district. Properties near Mina made notable increases, especially the Red Devils or Farnham and Drew properties. Prospecting was active in Nevada in 1917.

In Arizona and Oregon combined the production was 422 flasks in 1917, against 383 flasks from these states and Washington combined in 1916. The small output from Arizona came from the Mazatza Range and from new prospects near Phoenix, and most of the output from Oregon was derived from the Black Butte mine. Only prospecting and development work were carried on in the Morton district, in Washington, and the stage of production has not yet been reached in the Meadows district, near Gold Hill, in Oregon.

The market prices of quicksilver quoted in San Francisco increased from an average of $81 a flask in January to $126.25 in February, but declined to $113.75 in March, $114.50 in April, $104 in May, and $85 in June. In July the average rose to $102 and in August to $115, falling in September to $112 and in October to $102, rising again in November to $102.50 and in December to $115. The average for the year was $106.12, but producers received, as usual, considerably less for metal sold at the mines. The high prices were due to greatly increased war demands, principally for making fulminate for explosives, antifouling paint for ship bottoms, drugs and storage batteries, and for amalgamating gold and silver ores, but were due also to the large increase of exports over imports.

The exports of quicksilver for the first ten months of 1917 were 10,222 flasks, against 8,880 flasks for the entire year 1916, and the imports were 4,491 flasks for the first nine months of 1917, against 5,659 flasks for all of 1916.

Most of the output continues to come from properties that were producing before the war, but part of it comes from old surface material, for new development work and furnace construction require time and money, and quicksilver deposits, unlike the larger deposits of more common metals, are not readily measurable in a quantitative way. Uncertainty as to war demands and post-war markets and prices have prevented extensive financing of an industry in which there had been little profit for decades before the war. Some improvement in the treatment of low-grade ores is indicated at the larger properties, and it is from low-grade ores that the supply of the future must chiefly come.

Final Figures Menhaden Oil Production, 1917.

Since the annual forms containing the fish oil market were sent to press the following details of the 1917 menhaden oil production were received. As compared with the production of the previous year, there was but 187 barrels difference in the total, the production by districts being as follows:—

District.	Barrels.
Chesapeake Bay	35,000
North Carolina	24,000
Delaware River	5,964
Florida	2,500
Texas	1,400
Georgia	2,180
Northern factories—	
Barren Island, Port Monmouth	1,400
Total	72,444

For 1916 72,631 barrels.